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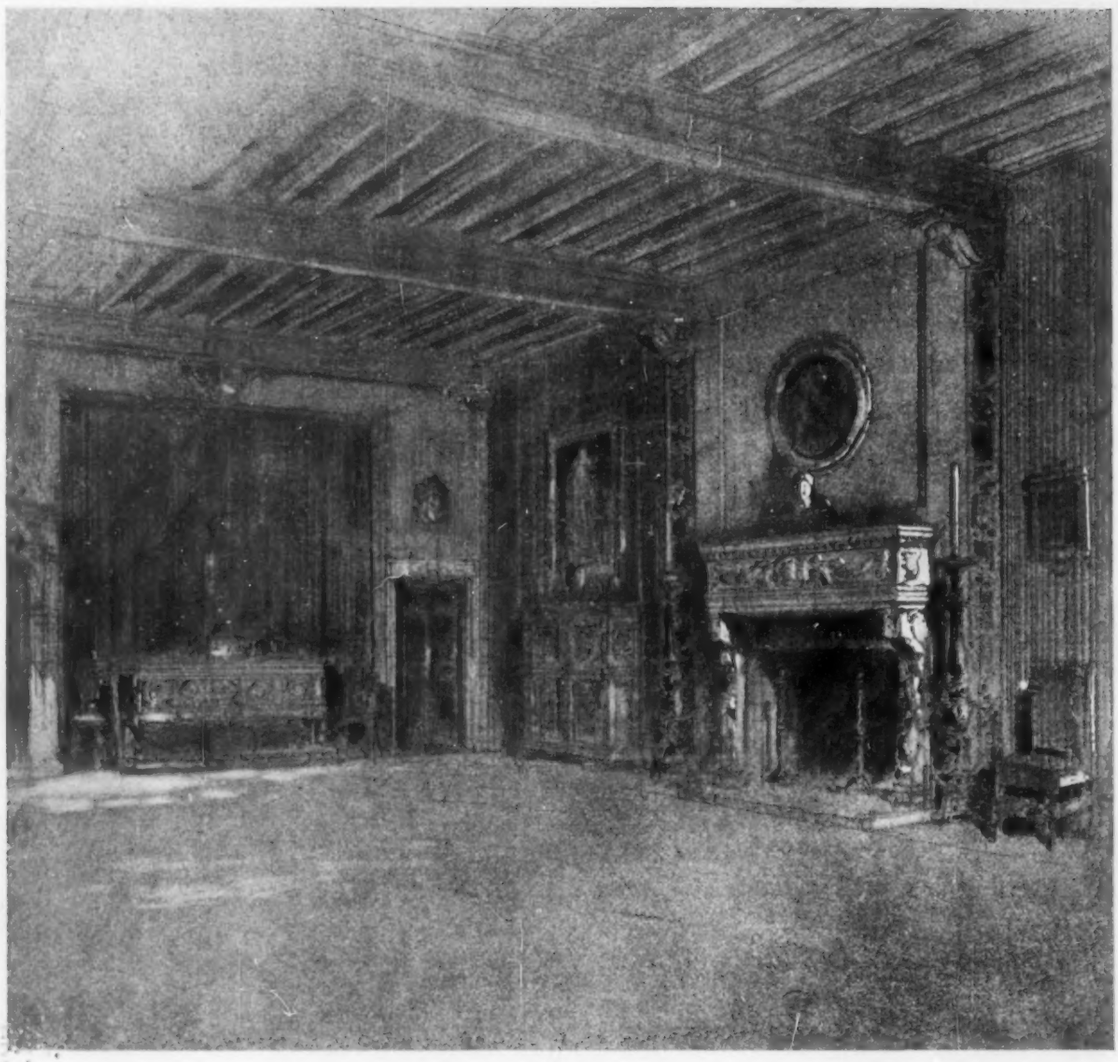


PENCIL SKETCH OF AN INTERIOR
BY O. R. EGGERS
John Russell Pope, Architect

THE ARCHITECTURAL FORUM
FOR QUARTER CENTURY THE BRICKBUILDER
VOLUME XXXII JANUARY 1920 NUMBER 1

Notes on the Inter-Professional Conference

By ROBERT D. KOHN

AT the close of the fourth session, the organization meeting, of the Inter-Professional Conference, Saturday afternoon, November 29, one of the leading economists of the country, who had been present throughout the two days of meetings, expressed himself as follows: "I have experienced the two most interesting days of my life." There were probably many professional people at that meeting who felt the same way about it. The other expression most common among the people attending all the sessions was this: "The architects of the country certainly rendered a great service to the other professions when they brought them together in this meeting to start this co-operative effort."

The history of the Inter-Professional movement is very brief. The Post-War Committee on Architectural Practice announced in one of its early programs that it desired to bring together representatives of the different professions in order to compare professional standards, to attempt to define the distinctive functions of each profession, to attempt to find means for co-operation between them, and to work jointly toward the betterment of the educational methods now in vogue in the training for the different professions.

Considerable interest was manifested throughout the country in this topic and, accordingly, the executives of the Post-War Committee decided to approach the other professions with a view to forming an Inter-Professional Conference organization to further these ends. A small volunteer committee was formed, representing the law, medicine, engineering, education, architecture and other professions. Invitations were issued broadcast for a meeting to be held in Detroit on the two days following Thanksgiving Day. In view of the haste with which the whole preliminary program was prepared and announcements issued, it was surprising to the promoters to find over a hundred professional people in attendance, representing twelve or fourteen different professions.

Perhaps the most valuable single element that made for the success of these meetings was the opening address of President Kimball of the American Institute of Architects. The keynote of his speech was that this was the beginning of an effort to clarify and to organize that foundation of unselfish service which was essential to professional progress in all fields. The effect of his address was so telling that even those who came out of mere curiosity immediately realized the significance of this new movement, and the speakers for the other professions followed with declarations of interest filled with the same high purpose.

The reports of these addresses will shortly be available. It will suffice here merely to record that in the replies to Mr. Kimball medicine was ably represented by Dr. George E. McKean of Detroit; the law by Dean Henry M. Bates of Ann Arbor; the librarians by Mr. W. W. Bishop of Ann Arbor; dentistry by Dr. W. G. Ebersole of Cleveland; trained nurses by Miss Dora M. Barnes; the professional women by Miss Lena M. Phillips; the woman lawyers by Miss Laula Laddey of Newark, and the mechanical engineers by Mr. Charles Whiting Baker of New York. Equally able expressions of interest in the new movement were delivered by representatives of the state geologists, research scientists, economists and journalists.

The second session of the first day was devoted to the general consideration of plan and scope of the new organization, and ways and means by which it could be supported and its objects furthered. Committees were appointed to prepare reports on these subjects, as well as on matters that might at once become the subject of co-operation between professions.

At the morning session of Saturday, November 29 (the third session), reports of the committees were received and a permanent organization decided upon. The Committee on Plan and Scope presented a declaration of purpose, which after some modifications and considerable debate was accepted in the following form:

"To discover how to liberate the professions from the domination of selfish interest, both within and without the professions; to devise ways and means of better utilizing the professional heritage of knowledge and skill for the benefit of society, and to create relations between the professions leading to this end."

The Committee on Ways and Means recommended that the organization be supported by two classes of membership: a sustaining membership at $10 a year and a general membership with dues of $1 a year. It was also suggested that certain of those present might care to act as underwriters of larger contributions to help the organization in its start. It is interesting to note here that at the closing session more than $1,000 was subscribed toward the preliminary expenses.

It is particularly notable that the conference decided that even in its form it should be of a new type. Instead of having a president and sundry vice-presidents, secretary, treasurer, etc., it was decided that the government of the organization should be through a council of twenty-one, representative of the different professions. The only officer to be known to the public will be the Executive Secretary, who was thereupon elected, as was the Council. The Council elects its own chairman, secretary and treasurer merely for the convenience of Council business. The Council is the sole and the responsible guide of the affairs of the organization.

In planning a scheme of work it was decided that the principal efforts of the organization will have to be made locally. Inter-Professional Conference organizations are to be started in every large community and definite co-operative work organized by these local conferences. The national organization may in the end devote itself mainly to the promotion of these local efforts.

The transactions of the two days of the Detroit conference are to be printed in pamphlet form and will unquestionably give the best record of the purposes of the Inter-Professional Conference and the ways in which they are to be effected.*

As a supplement to the actual report of the meeting, the comments of those who attended the conference are very illuminating. There were frequent expressions of astonishment by representatives of some one of the professions with regard to the enlightened point of view of some other profession. A Cleveland physician got up at one point and said: "I am frank to say that I am surprised and delighted that other professions than my own are interested in this matter of public service. It may have been my own blindness, but I must admit that before this conference I had no idea that the architects and engineers of this country considered their work as a public service; that they are trying to develop the idea of service to the exclusion of selfish interests."

A newspaper man who came to report proceedings and remained to take part in them said: "These meetings have made me want to go out and help organize the journalists of the country into an association with some principles and some measure of recognition of the function of disinterested public service that some of you professional men are trying to realize in your own associations. I intend to try to form such an organization before another annual meeting of this Conference."

In considering the fields of work in which co-operation between the professions would be helpful, it was immediately recognized that the housing movement is an important instance. It needs not only the support and technical knowledge of the architects, but also of the doctors on the side of health; of the engineers on the side of sanitation, water supply, etc.; of the landscape architects on the side of town planning; of the trained nurses on the side of home nursing and the health problems of the family; of dentists on the side of dental hygiene, and of the legal profession to aid in meeting those problems of law which are bound to be involved in any progressive movement of this kind. A medical man present advanced the idea that the help of all these professions was needed in the proper consideration of the public health service. The librarians and teachers called attention to the valuable aid they could render in movements of this kind and in improving technical education generally.* Each profession acknowledged its weakness in effecting the public ends to which it was devoting itself; the suspicion of self-interest to which it was always open, and the invaluable aid that might come from co-operation between professions in meeting these ends.

The Post-War Committee on Architectural Practice may certainly look upon this child of its efforts with great pride. If the Committee accomplishes nothing else, it will have started in this Inter-Professional Conference a movement which, in the opinion of most of those who attended the Detroit meetings, will prove one of the most valuable agencies for efficient government and democracy.

The General Council elected for the first year included: C. T. Chenery, Basil M. Manly and Charles H. Whitaker, Washington, D. C.; Dr. W. G. Ebersole, Cleveland; Dr. Gillette Hayden, Columbus, Ohio; Thomas R. Kimball, Omaha; Paula Laddey, Newark, N. J.; M. B. Medary, Jr., Philadelphia; W. W. Bishop and Dora M. Barnes, Ann Arbor; Frederick L. Ackerman, Felix Adler, Robert D. Kohn, E. J. Mehren, Lena M. Phillips and Calvin W. Rice of New York.

*Applications for this information should be made to Mrs. Katharine Vassault, Executive Secretary, 56 West 45th Street, New York City.

*Some of the members of the American Institute of Architects mentioned the plan proposed by their Committee on Education to publish popular text books for high school and college use on the significance of the arts. Some librarians present said that their experience would make it possible for them to offer valuable suggestions as to the ways in which such matters could best be presented.

Anchor Cap Company, L. I. City
3.1 acres of floor space
Ballinger & Perrot, Architects

Sears-Roebuck Plant, Philadelphia
For annual business of $50,000,000, cost $7,500,000
George C. Nimmons & Co., Architects

Bunte Candy Factory, Chicago
Reinforced concrete, cost $1,750,000
Richard E. Schmidt, Garden & Martin Architects

Review of Building Activity in 1919

ACCOMPANIED BY ILLUSTRATIONS OF SOME IMPORTANT BUILDINGS NOW UNDER CONSTRUCTION

THE year 1919 has been one of unusual interest to the building industry, and during the past few months perhaps more traditions have been upset and more new ways of approaching problems been required than in any previous year in the history of the United States. The start of the year saw us but lately emerged from the conflict of the great war, and building construction, as far as private operations were concerned, practically at a full stop. Starting from this low level and facing serious conditions in the lack of labor and materials, and with a new and untried price level which was held by many to be prohibitive, activity has constantly increased until with the close of the year a total of investments in building construction has been reached that surpasses any figure on record and shows great promise of continuing into 1920, with indications that the figures will exceed those of last year.

The American Contractor has recently compiled some statistics based on reports from 171 cities, that show a total estimated value of $1,326,936,702 for permits issued, constituting a gain of 198 per cent over a total of $445,549,493 for the same cities in 1918. An analysis of these statistics shows that the culmination of this activity was in August, after which there was a slight recession, with December showing a second upward swing of the curve. Statistics compiled by the F. W. Dodge Company, which include engineering works, show total figures for the country over the first eleven months of the year to be $2,332,902,000 against a total of $1,631,929,000 in 1918, and of the latter, 33 per cent represented Government work largely connected with the war.

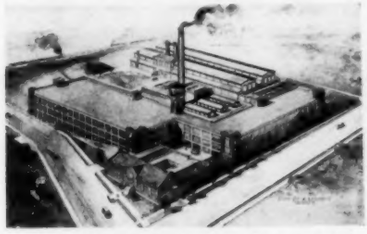
A further analysis made by the F. W. Dodge Company shows the building construction of the first nine months of 1919 compared with the total amount

American Chicle Plant, L. I. City
200 by 600 feet, floor space 13 acres
Ballinger & Perrot, Architects

Hydrox Company Plant, Chicago
For soft drinks and ice cream, cost $500,000
Richard E. Schmidt, Garden & Martin, Architects

S. Karpen & Bros., L. I. City
490 feet long and 73 to 135 feet wide
Ballinger & Perrot, Architects

W. H. Schmelzel Warehouse, St. Paul
Cost $75,000
Clarence H. Johnston, Architect



Bridge & Beach Plant, St. Louis
Cost $800,000
Klipstein & Rathmann, Architects

Ramer Candy Co., St. Paul
120 by 140 feet, cost $375,000
Clarence H. Johnston, Architect

Port Morris Holding Co., Bronx, N. Y.
Piano factory, floor space 3 acres
Ballinger & Perrot, Architects

Dixie Terminal, Cincinnati
Office and terminal, cost $2,000,000
Garber & Woodward, Architects

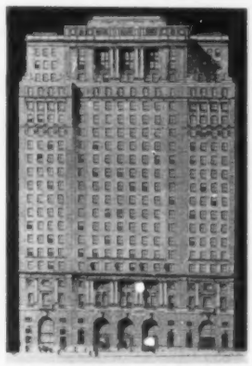
Grinnell Co. Office, Providence
Jackson, Robertson & Adams
Architects

Industrial Trust Bank, Providence
Jackson, Robertson & Adams
Architects

Braunstein-Blatt Store, Phila.
Cost $750,000
Price & McLanahan, Architects

of construction for each of the ten full years preceding, as indicated in the table below. A great deal of the increase shown in 1919 is, of course, represented by the lower purchasing power of the dollar, but granting this, there is still ample evidence of increased activity.

Association Bldg., New York
Starrett & Van Vleck
Architects



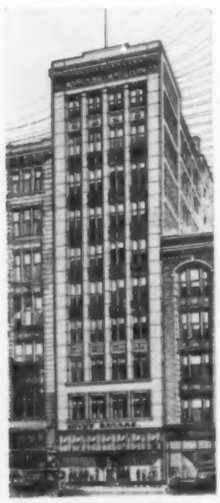
Cunard Building, New York
Benjamin W. Morris and Carrère
& Hastings, Associate Architects

Year	Greater New York	Philadelphia and Vicinity	Cook County, Illinois
1910	$127,306,500	$32,753,000	$56,093,050
1911	122,886,000	38,924,000	50,845,313
1912	121,206,000	71,366,000	49,524,000
1913	116,683,900	32,633,000	41,029,000
1914	46,261,500	36,784,000	72,096,600
1915	67,164,683	42,001,000	115,144,600
1916	121,279,000	67,020,000	132,275,845
1917	114,182,000	78,695,000	157,258,000
1918	68,105,000	78,305,000	79,153,000
1919 (1st 9 mos.)	204,472,000	81,788,000	127,688,877

These figures are the more astonishing when it is realized that they include but a very small amount of speculative building. The speculator has turned his attention to existing real estate as a more attractive field for quick profits. The figures represent, chiefly, buildings for commercial and industrial expansion, together with housing accommodations and hotels that were forced into erection by pressing needs, and in view of the four years of inactivity it is evident that the potential building demand has been no more than touched. It is estimated that the building requirements of the country at the beginning of this year are in excess of $3,000,000,000.

The remarkable activity in 1919 has taken place in no special areas; it has been general throughout the country. Some cities, however, stand out conspicuously in the great gains, notably Chicago, with a total for the year of over $105,000,000

Hartford Fire Insurance Co. Office, Hartford, Conn.
106,000 square feet of floor space, cost $2,000,000
Parker, Thomas & Rice, Architects; Edwin Sherrill Dodge, Associate



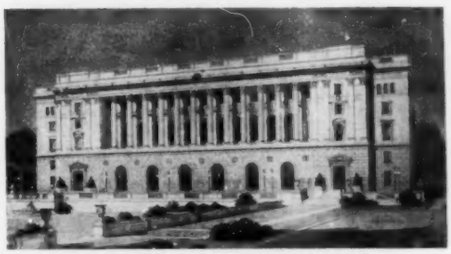
Heyn's Bazaar, Detroit
Cost $400,000
Albert Kahn, Architect

Durant Building, General Motors Company, Detroit, Mich.
Cost $8,000,000
Albert Kahn, Architect

First National Bank, Detroit
Cost $4,000,000
Albert Kahn, Architect

and Greater New York with $251,083,619 compared with $34,792,200 and $68,161,479 — the respective figures in 1918.

In New England, 1919 has exceeded any year since records were first kept in 1901: contracts for October amounted to $32,384,000, of which $7,351,000 was for residential buildings; $13,621,000 for manufacturing buildings, and $6,536,000 for business purposes. General percentages covering the work of the country show residential work to constitute one-third, manufacturing and industrial another third, general business 15 per cent, and public work and utilities 10 per cent. Activity in Manhattan has chiefly been in business structures, but in the other boroughs making up Greater New York the activity has been largely residential. One operation now in the Borough of Queens is the largest single housing development yet undertaken in the vicinity of New York. It is the construction at Broadway-Flushing of 225 single houses at a cost of $12,000 each.



Centennial Building, Springfield, Ill.
Cost $1,250,000
Richard E. Schmidt, Garden & Martin, Architects

Live Stock Pavilion, Minnesota State Fair
235 by 400 feet; 1,250 head of cattle, cost $375,000
Clarence H. Johnston, Architect

Capital for building seems to be most plentiful in the Middle West, where operations are greatly exceeding all previous figures. Mortgage money, however, in most parts of the country, will undoubtedly remain high, that is, in the neighborhood of 6 per cent, with the exception of some funds for ultra-conservative loans that may be placed at 5½ per cent. Trustees of large estates can no longer afford to loan on mortgage under 6 per cent interest, for with heavy income taxes their net return is below what they can get from investments in tax exempt securities. Another reason is the fact that large insurance companies which have always been a source for building money have invested heavily in Government securities, and as a result will not be prominent in the building money market for some time to come.

Much good would ensue to the housing movement if mortgage investments in small sums were exempt from taxation. There is now a bill pending in Congress which provides that income from mortgages not over $40,000 held by individuals shall be exempt from taxation. If such legislation were passed, it would be effective in popularizing mortgage loans and would do more than anything else toward reducing the interest rate.

The high price of building materials has, of course, interfered with carrying out some projects, notably in the case of public work through insufficient appropriations. Recent quotations, however, have shown no evidence of weakening in market prices, practically all commodities showing a steady rise from month to month. The high point is not reached yet, according to some authorities. Production is not catching up with demand to

Chicago Beach Hotel, Chicago
Cost $2,500,000
George C. Nimmons & Co., Architects

Lorraine Hotel, Chicago
Cost $1,000,000
Richard E. Schmidt, Garden & Martin, Architects

Fort Armstrong Theater, Rock Island
Cost $300,000
Cervin & Horn, Architects

Rittenhouse Plaza Hotel, Philadelphia
Cost $2,500,000
Price & McLanahan, Architects

Summit School for Girls, St. Paul
Cost $150,000
Clarence H. Johnston, Architect

Y. M. C. A., Pittsburgh
Cost $225,000
Edward B. Lee, Architect

Maternity Hospital, St. Paul
For Salvation Army, cost $250,000; 150 beds
Clarence H. Johnston, Architect

any appreciable extent; it is restricted through lack of common labor and the difficulty of obtaining raw materials, and in the meanwhile the first spurt of building activity runs beyond the total of the country's biggest year. It is, therefore, generally conceded that the high peak will not be reached until the summer or possibly the fall of 1920.

We recently requested a number of architects to furnish us with perspective views of buildings they had designed that were actually under construction and included in the year's record. The most important of the material received is illustrated herewith. No reference is made to residential work because general interest is greater in commercial and public work. Similarly no reference is made to structures costing less than $100,000, although a large part of the year's figures comprise lesser work, and many offices report that they have an equal amount of building that comes below that figure.

In addition to those buildings illustrated the following indicates activity in various sections of the country. It is not possible to publish perspective views of these buildings, owing to the fact that architects have been affected by a lack of draftsmen and urged on to speed by their clients so that time has not been taken to make rendered drawings.

Albert Kahn, Detroit, Mich., has buildings under construction totaling $23,100,000. Those in addition to the buildings illustrated are:

Crerar Library, Chicago
Office and Library Bldg., cost $1,200,000
Holabird & Roche, Architects

Durant Hotel, Flint, Mich.
Cost $1,200,000
Esenwein & Johnson, Architects

Stacey-Trent Hotel, Trenton
Cost $1,600,000
Esenwein & Johnson, Architects

Kamargo Hotel, Watertown, N. Y.
Cost $650,000
Esenwein & Johnson, Architects

Recreation Building, Easthampton, Mass.
West Boylston Mfg. Co., cost $200,000
Murphy & Dana, Architects

King Edward Hotel, Toronto, Can.
Cost $1,900,000
Esenwein & Johnson, Architects

Social Center Building, Urbana
Wesley Foundation, Univ. of Ill., cost $300,000
Holabird & Roche, Architects

Charles T. Miller Hospital, St. Paul
250 beds, private rooms, cost $900,000. Clarence H. Johnston, Architect

Mary Frances Skiff Hospital, Newton, Ia.
Cost $130,000. Cervin & Horn, Architects

Additions to Packard Motor Car Company Plant, Detroit $1,000,000
Packard Service Building, Detroit $500,000
Packard Service Building, Chicago $600,000
Service Building, Ford Motor Co. $500,000
Body Building Plant, Ford Motor Co. $2,000,000
Studebaker Corporation Bldg. $300,000
Cadillac Motor Company Service Bldg., Detroit $600,000
Cadillac Motor Company Office Bldg., Detroit $250,000
Cadillac Motor Company Service Bldg., Chicago $500,000
Paige Motor Co. $500,000
Detroit Seamless Steel Tube Company $500,000
Detroit Creamery Bldg. $400,000
Fisher Body Company Bldg. $250,000
Wadsworth Mfg. Co. Bldg. 750,000

Tuberculosis Sanatorium, Memphis, Tenn.
150 bed patients, cost $300,000
Jones & Furbringer, Architects

University of Michigan Hospital, Ann Arbor
Cost $1,500,000
Albert Kahn, Architect

Grocery, George Bobb & Sons Co., Columbus, O. ... $240,000
Marting Theater Bldg., Ironton, O. $150,000
The United States Chain & Forging Co. York, Pa. $160,000
Moose Club, Lima, O. $100,000
Millard F. Field Bldg., Ashland, Ky. $200,000
Addition to High School, Alliance, O. $400,000
Grade and High School, Miamisburg, O. $225,000
The Morehouse-Martens Co. Department Store, Columbus, O. $400,000
John J. Carroll Dept. Store, Newark, O. $200,000
Administration, Muskingum College, New Concord, O. $200,000
Office and Bank Bldg., Franklin Loan & Savings Co., Columbus, O. $150,000

Esenwein & Johnson, Buffalo, N. Y., report the following in addition to those illustrated:

Lafayette High School, Buffalo $450,000
Hotel Lawrence, Erie, Pa. 260,000
Hotel Windsor, Windsor, Ont. 800,000
Jeweler's Store, Buffalo 110,000

Frank L. Packard, Columbus, O., has work totaling $2,425,000 as follows:

Hentz, Reid & Adler of Atlanta, Ga., have under construction a motion picture theater, $750,000; store building for the George Muse Clothing Co., $300,000, and the Wesley Memorial Hospital located at Emory University, $500,000.

Marshall & Fox, Chicago, Ill., are now erecting the Drake Hotel at North Michigan avenue and Lake Shore drive, Chicago, at an estimated cost of $3,500,000.

George C. Nimmons & Co., Chicago, Ill., have in addition to the buildings illustrated the following:

Nurses' Home, Harper Hospital, Detroit
Cost $550,000. Albert Kahn, Architect

Additions to Evanston Hospital, Evanston, Ill.
Cost $400,000. Richard E. Schmidt, Garden & Martin, Architects

Apartments, Jackson Heights, New York
Andrew J. Thomas, Architect

Map of Lower New York City
Showing Reality Sales in 1919

Apartments, Sterling Reality Co., Bronx, N. Y.
Andrew J. Thomas, Architect

Federal Electric Company Building, Chicago, $275,000; Walker Vehicle Company, $280,000; addition to the Wall Paper Building of Sears-Roebuck Company, $400,000; Paint Building, Sears-Roebuck Company, $400,000; Steinhall Mfg. Company Building, $100,000, and the Murray Store and Office Building, Streator, Ill., $200,000.

Allison & Allison, Los Angeles, Calif., have a total of $935,000 for buildings costing in excess of $100,000 each, represented by schools at Merced, Los Angeles, Verbank, Fowler, Santa Monica, Calif. and Chandler, Ariz. also a packing house for Simoneira Company at Santa Paula, Calif., costing $150,000.

Edward B. Lee, Pittsburgh, Pa., has an office building under construction at Port Arthur, Tex., for the Gulf Refining Company, totaling $450,000, the Y. M. C. A. in Pittsburgh, costing $225,000, and the School of Dentistry at the University of Pittsburgh, estimated at $550,000.

Tocker & Marsh, New York, N. Y., have four public school buildings, totaling $935,000, and are now working on a $400,000 program for school buildings for the city of Norwich, N. Y.

Of Boston architects, Maginnis & Walsh are building at Scranton, Pa., the Venard Apostolic School, at a cost of $250,000; R. Clipston Sturgis has under construction the Bird School, East Walpole, Mass., costing $135,000; and Parker, Thomas & Rice have, in addition to the Hartford Fire Insurance Building illustrated, a building for the New England Telephone & Telegraph Company, costing $600,000; and in their Baltimore office have an addition to St. Bartholomew's Hospital, New York, totaling $200,000, and the Ober Office Building, Baltimore, $150,000.

The soundness of the present activity in building construction is shown by the unprecedented real estate situation in lower New York City. Here there has been very great activity, as may be seen from a glance at the map reproduced. Many of the larger buildings have been acquired by large corporations for offices and have thus been permanently taken out of the market. Many office buildings, apartments and hotels are now under construction; but it will be years before the demand in New York will be met, even with most intensive building. In the meantime, property values and rentals have advanced beyond the expectations of the most optimistic real estate operator.

The prospects for 1920 are that the larger cities will see tremendous activity in the construction of apartments and residential hotels, with housing and schools prominent in all localities. A significant sign is the greater participation the public is taking in the financing of big building operations. Through the medium of bond houses, bonds issued against guaranteed mortgages are being sold to the public, and in that way a new and very large reservoir for construction money has been opened.

Group of Small Apartments, Akron, Ohio
Andrew J. Thomas, Architect

Housing Development, Easthampton, Mass.
West Boylston Mfg. Co., 146 houses, cost $4,000 each. Murphy & Dana, Architects

The Kitchenette Apartment

I. PLAN AND GENERAL CONSIDERATIONS

By CARL A. ERIKSON
of Richard E. Schmidt, Garden & Martin, Architects

THE housing expert, the sociologist, the economist and other highbrows will unanimously agree that these apartments are a vicious, unhealthy, debasing offspring of our equally-to-be-condemned industrial civilization. This may be admitted while we wait with baited breath on each new Industrial Conference to solve the problem—with more words.

In the meantime we, as architects, are faced by a double barreled demand. From the investors, a demand for returns commensurate with the increased cost of building; from the tenants, a demand for cheaper housing, surcease from the problem of domestic help, and for greater ease of living. To these the "kitchenette" apartment offers a solution. We may regret the use of the "condensed" apartments, but we can't stop it—at least, not until after the various Conferences have rendered their decision, so let us use our most intelligent effort toward solving the peculiar problems involved by methods ready to hand.

The "condensed" or kitchenette apartment in its essentials consists of a living room with a concealed bed, a bath, a dressing closet; and, in one room, a tiny kitchen and dining room. It is obvious that the two rooms function as four; and in Chicago the rentals are in the latter proportion if not greater. Therein lies its popularity with both tenant and landlord: two rooms require less attention than four; two rooms cost less to build than four and yield the same return. "Q.E.D."

Not quite as favorable is the report from the standpoint of public policy. These apartments do increase the congestion, for two apartments flower where only one bloomed before. Debating the question as to whether this isn't a cause rather than an effect may be as futile as the historic debate as to the precedence of the chicken or the egg.

We have become so accustomed to sleeping and

The Surf Apartment Hotel, Chicago, Ill.
J. A. Armstrong, Architect

First Floor Plan of Surf Apartment Hotel, Chicago, Ill.

these buildings would, therefore, tend to decrease the birth rate. This is probably arguing backwards again: children aren't born into this world to fill rooms, at least not in the economic strata in which these buildings function. The typically American decline of a neighborhood from "plutocratic" to "bourgeois," and from "bourgeois" to "proletariat" and then to slums, will have what effect on these apartments? Surely the menace of unhealthy living conditions is reduced to the minimum; the rooms are large with large window area. The toilet facilities are convenient and ample. Care will be needed to insure that the large dressing closets are not used as sleeping quarters or that they do not become pest holes. Even this is minimized to some extent by the ventilating ducts which will exhaust some air from these places whether fans are used or not. On the whole they will be far better slums than the old type apartment, housing many families in what was intended for one.

lounging in separate rooms that we are very apt to condemn these apartments as being a menace to the health of the occupants. But why should it be? In these quarters every inducement is offered to "throw open the window and influenza" by the convenient and heated dressing room adjacent — a luxury only a few of the more expensive houses afford. In addition, the vent ducts from the kitchenettes, the bed closet and the dressing room insure a constant movement of air through the apartment, even though the windows be closed. It might be objected that it is unhealthy to sleep in a bed that has remained cooped up in a closet, no matter how well ventilated. This has some merit to it, but the careful management will see that the beds are properly aired and "sunshined" at intervals; about all that the most careful housewife does. With the change of tenants, it is imperative, of course, that the entire apartment and its furnishings be thoroughly cleaned, especially the mattress and pillows.

Children are not wanted, though they are usually tolerated. One might argue that

At the present time the kitchenette building or

Typical Floor Plan of Surf Apartment Hotel, Chicago, Ill.
Corner Apartments with Sun-Room rent for $300 per Month.
J. A. Armstrong, Architect

"bedhouse" has almost swept the ordinary type of apartment from the boards, for it is difficult to convince the loan brokers that high enough rentals are possible for the former type of building to warrant the necessarily large loan. In this newer type the evidence is everywhere at hand that it is possible to show a very remunerative return on the investment. In Chicago they have lived through only one crisis — that attendant upon our entering the war. The experience during this period indicates a smaller loss through vacancies than of any other type of dwelling. Whether the high rentals now possible will continue after the present congestion has been relieved, is problematical. In most buildings the rentals are at such high figures that a considerable reduction is possible without bringing the return down to that of the ordinary apartment building. When the investment return sinks below that of the apartment house, the pendulum will swing back again. Maintenance costs will depend entirely on the kind of service given; where the apartments are let unfurnished and without delivery service, they will be less per apartment, but greater per square foot, than the older type. Where they are let furnished and with hotel service rentals are higher, and so, too, the depreciation, maintenance and service costs.

The continuance of a healthy condition of the balance sheet depends largely on whether or not they fill a lasting demand by the public. Here it may be well to digress a minute or two to consider the pedigree (would family tree be the better word?) of this "new fangled critter."

Lest any one be misled, let me hasten to disclaim that these buildings are not redolent with "the Spirit of the Prairies" nor a product of Chicago's "Indigenous Architecture" factories. They probably have a pedigree reaching back to the monkey era; but in this paper it will be unnecessary to go farther back than, say, Marcus Aurelius. When the retired (always synonymous with wealthy or at least well-to-do) slave merchant hied himself to the Los Angeles of the day, he preferred to leave as many of his servants behind as possible, as this eased his and Mrs. Slave Merchant's mind of domestic cares, and his thrifty eye was well pleased. There were others, too, in imperial Rome who, because of the acute housing shortage, lived in "light housekeeping" rooms, or, perhaps, even in the hostels, prepared a light breakfast over the charcoal brazier.

View in Lobby of Surf Apartment Hotel

Having given these apartments a background, let's skip the intervening period and return to their rebirth in California, the playground of the superannuated, the young,— the maiden aunts, the school teachers and the "tired" business man. Here the demand for furnished apartments was insatiable; the leases were necessarily for a short term; domestic cares were a bugaboo, and yet the thrifty Yankees wanted to prepare their own coffee for breakfast.

We may remember the folding bed of years ago — some may remember the tales of the people who were hastened into the next life when the thing inconsiderately closed upon them. It seems to have gone into the attic with the pot bellied stove and the walnut furniture. The maiden aunts and the grandmothers needs must have a place to entertain. The bedroom, never! The hotel lobbies, too public. So comes the development of the concealed bed. The unfortunate city dweller is already familiar with the unsuspectingly hard Davenport, which is

Roof Garden of Surf Apartment Hotel

"so convenient when guests drop in": with the comfortable fireside chair which embowels a bed, and, perhaps, with the "Adam" library table where the midnight oil is transmuted into midnight snores. The tales told by the loiterers in our Mecca of how the bed escaped censure by discreetly hiding behind a buffet (household variety) or sliding carelessly under the dining room —require almost a childlike credence. However, our "very best people" will vouch for even greater acrobatics on the part of that deceiver.

Mecca, and then Paradise for the true believers of the Prophet; so with our friends —California—and—what *does* come after that? Gradually the idea became familiar to the effete East (*sic* Chicago), and a few courageous builders ventured their shekels and won. Now "everybody's doing it."

The first reason for the growing popularity of these apartments is the shortage of domestic help and the unsatisfactory quality of what there is. This makes it imperative that "milady" reduce the work around her quarters to a minimum, lest, through her enforced labors, she "reduces" without the strenuous, but genteel, exercises of the beauty columns. For such as she these apartments offer an almost complete escape from menial tasks. In the larger, and more elaborately appointed, apartments the service extends to caring for the rooms and making the beds. If desired, "milady" may have her tea and toast in bed served from the main kitchen; she may have expert maid service, and hairdressers, manicurists and beauty specialists are at her beck and call. The service furnished by such apartments as the "Surf" is equal to that in the very best hotels.

Some question has been raised as to whether the high class apartment of this type will continue to be popular with the people who can pay from $100 to $300 per month for these rooms. Men experienced in the management of the residential or family hotel agree that the kitchenette and its "dinette" twin fill a very real demand. All of us like some dishes prepared in a special way—a way that cannot be accomplished in the hotel. Mr. Statler has tried to meet this need in the new Pennsylvania Hotel by providing a "homecooking kitchen." His success is problematical. Further, all of us, at times, would like a change from the hotel cooking—"home" (or otherwise); sometimes we do wish to avoid inspection by the alert captains, waiters, bus-boys and fellow-patrons; we don't always like to dress for dinner (especially the ladies), and on Sunday "mornin'" how we do hate to get up for breakfast! In spite of much comment to the contrary, it is pretty well established that the plutocrats are like the rest of us and occasionally want to get a "snack" for their friends in the privacy of their own rooms without the assistance of the obsequious waiter. They don't wish to do all their entertaining in the public lobbies, nor do many of them care for their bedrooms as places of entertainment. The kitchenette apartment of the better grade solves both problems. Dine when, where and how one wishes. The concealed bed makes the extra room (and extra rental) unnecessary.

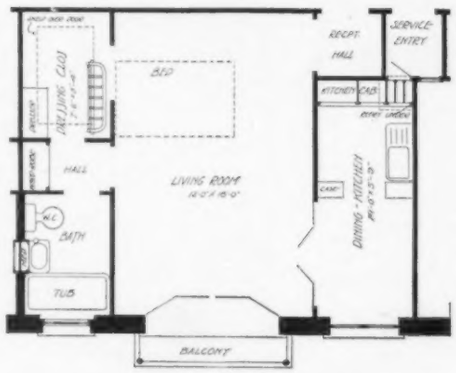


Fig. 1. Plan of Two-Room Unit

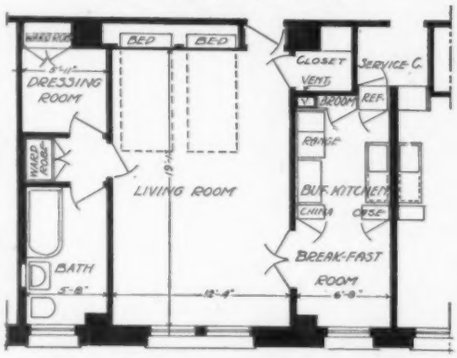


Fig. 2. Twin Bed Unit for Fireproof Building

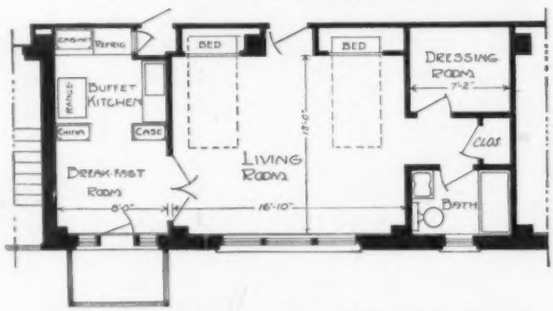


Fig. 3. Twin Bed Unit for Shallow Depth in Plan

Another reason for the popularity of the kitchenette with the tenant is the tendency to visit summer and winter resorts. As Chicago bids farewell to its own families which flock farther north, it greets a numerous and constantly increasing colony of summer guests. Leases can usually be arranged for any length of time so that these buildings fit well into this nomadic life.

All of the plans presented are of buildings in Chicago, and it is necessary to understand some parts of the Chicago Building Code to understand the plans. Building and health departments of the city have "ruled" that these buildings are

apartments and not hotels, and therefore must comply in every respect with the code for buildings of Class VI. In most respects this is a very salutary proceeding, for in the apartment code minimum sizes of courts, vent shafts, etc., are specified; while for hotels the code is very indefinite on many of these points. It needs no great perspicuity to see that in kitchenette apartments the percentage of unoccupied area, sizes of courts, etc., should be greater than for the ordinary apartment building. In one respect this ruling is a distinct hardship to the property owner, for an apartment building may be only "1½ times as high as the widest street on which it abuts"—a hotel, however, must *not* exceed 200 feet in height. Is there any gain to the community in building residential hotels 200 feet high, without the safeguards to the health of the occupants afforded under the tenement house ordinance, and restricting the apartment hotel? In another phase the ruling is more questionable: a hotel may have inside bathrooms with exhaust ventilation; apartment house bathrooms must have "at least one window with a glass area of six square feet and a minimum width of one foot opening into a street, alley, yard, court or vent shaft." The result has been that the dressing closets are usually back of the bathrooms in dark, unhealthy closets. Would it not add to the "health, welfare and happiness" of the community to place the dressing closet (frequently containing the bed) on the outside, giving it sunlight and natural ventilation, and require the bathroom to have a mechanical exhaust? An ordinance has been introduced in the Chicago Council requiring that bed closets shall have a window; whether the scheme suggested would not be equally satisfactory, is debatable.

It is also necessary to bear in mind that "apartment houses, flats or tenements" may be built of ordinary (*i.e.*, brick walls and wood joists) construction, up to three stories in height, provided that each apartment is divided from every other on the same floor by a brick wall, and that each has direct access to two stairs. This will account for the radical difference in plan between the three-story buildings and the higher ones which are invariably fireproof. In the first type the stairways are numerous and occupy an unusually large percentage of the ground area. At the present lumber prices the cost of this type of building is probably almost as great per cubic foot and per apartment as a similar building of fireproof construction of the corridor type.

The "ordinary" construction buildings are usually without maid service. Packages are delivered at the rear entrance and garbage removed by the janitor. In either class of buildings, furnished or unfurnished apartments may be had. However, they are usually furnished, and wherever rentals are quoted they are for furnished apartments unless otherwise stated. Beds, of course, are always included.

Much of the success of these apartments will depend on the bed, concealed, of course. An uncomfortable one, or one whose concealment is difficult or attended by many "contraptions," would soon make the apartments tenantless. That the bed manufacturers have succeeded in eliminating awkward mechanical contrivances and, at the same time, making a comfortable bed is assured by the popularity of the high priced apartments. When the bed is down it has the appearance of an ordinary bed, even to the conventional head and foot ends, which have here even less than the usual justification. The springs are usually wire fabric; in the better ones, with coil springs below the fabric. The weight of the conventional box spring militates against its use, but with keen competition the manufacturers will probably soon develop a satisfactory box spring. To conceal the bed, it is necessary to raise the foot end and after it is in a vertical position to swing it around into its hiding place. This is easily done because of the simple mechanical contrivances on the bed. One type of bed is fastened to the door, which pivots with it but not on it; in another type the door must be opened first and the bed may then be swung around on its arm. Minimum clearances, etc., may be obtained from the manufacturers. Beds are, of course, made in all the usual

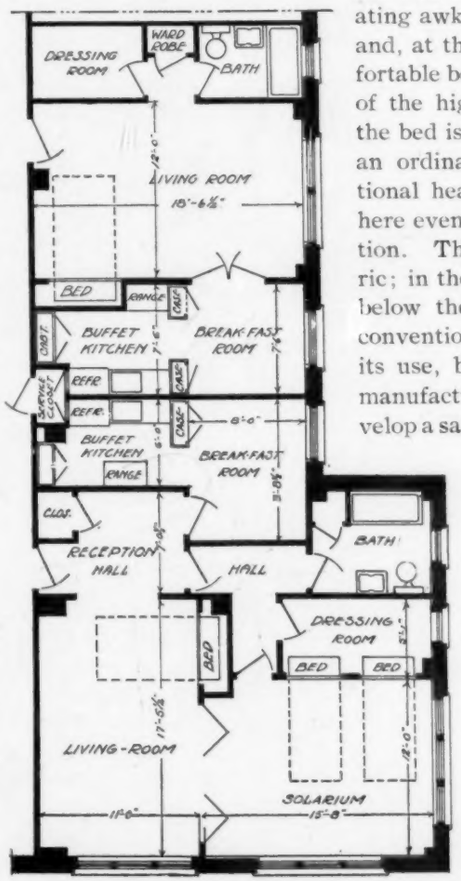


Fig. 4. Portion of Plan Showing Two Apartments, the Solarium Affording Additional Bed Space

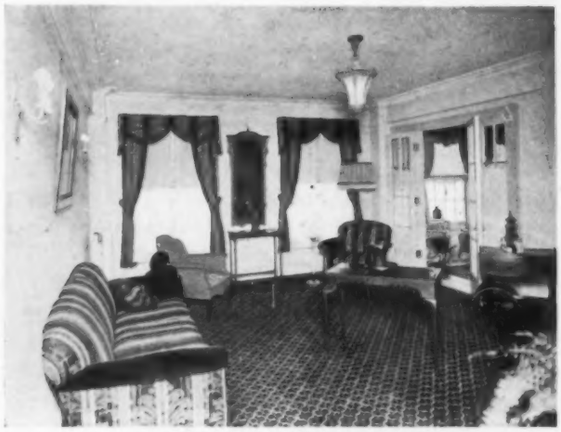


Fig. 5. Living Room in Surf Apartment Hotel

sizes: 3 feet, 3 feet 6 inches, 4 feet and 4 feet 6 inches wide.

The bed's position, both day and night, is clearly indicated on the plans of various units (Figs. 1, 2, 3 and 4). These are only a few of the infinite varieties of plans that will suggest themselves to the ingenious architect. These plans have all been tried and found to be satisfactory and economical. The tiny reception hall indicated in Fig. 1 has been found to be very desirable as adding an element of privacy to the apartment. Here it would be well to have a coat closet or wardrobe. It is usually more desirable to have the beds in separate closets, as in Figs. 2 and 3, rather than in dressing room, as in Fig. 1. All of these plans may be severely condemned as lacking in adequate closet space — a necessity recognized in all family hotels, but not yet fully appreciated by the majority of architects of these buildings.

It will be seen that the living room-bedroom is larger than the usual hotel room. In its furnishings the room does not belie its name (Fig. 5) and gives no hint of the bed. Fig. 6 shows the bed down with a glimpse of the dressing closet

Fig. 7. Arrangement with Special Closet for Bed, Surf Apartment Hotel

and the bathroom. Fig. 7 shows a room in which the door pivots with the bed, and serves to indicate character of the appointments better than any description would. From this class of furnishing the apartments run the entire scale — downward.

To enter the dressing room when the bed is up it is necessary to pass through the hall. When this is omitted the effectiveness of the unit is lessened a great deal, for the dressing closet and bath are then to all intents and purposes one room. In this hallway is placed a cabinet with one or two drawers for linen, a wardrobe, and another wardrobe above for off-season clothing.

The dressing closet explains itself. A great deal of ingenuity has been exercised in these rooms to make them more convenient and at the same time enable the tenant to store away more goods. In some apartments a dressing table and a "chiffo-robe" is provided instead of the dresser. Hanging rods

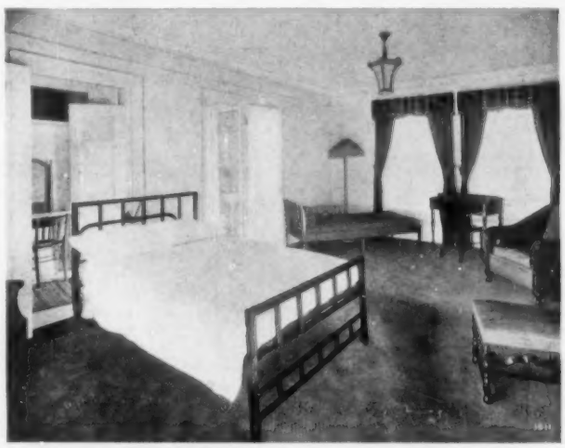


Fig. 6. Arrangement with Bed Pivoting into Dressing Closet, Surf Apartment Hotel

are usually provided close to the ceiling with special hangers so that the upper space may be used. Special designs have been made for the furniture to insure that every want of man and his mate may be met. Care should be taken in this room to insure good artificial light at the dresser. Plugs or receptacles should be provided for the inevitable curling iron. This room must be ventilated, preferably by exhaust fans, and arrangements should be made in the doors to the bathroom and hall to insure a supply of air.

The bathroom needs no comment, though it is not to be denied that many an apartment is rented on the strength of the "pi-dis-tal bowl." The one illustrated is the most economical in space, but some might consider it worth while to have it so arranged that it would be unnecessary to step into the tub to open the window. A shower over the tub is a very desirable feature, and the bath tub under the window makes this rather awkward.

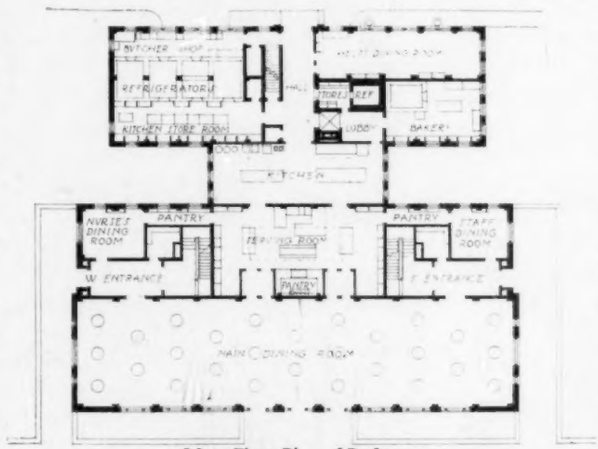
Tuberculosis Sanatorium at Mount McGregor, N. Y.

FOR THE EMPLOYEES OF THE METROPOLITAN LIFE INSURANCE COMPANY

D. EVERETT WAID, ARCHITECT

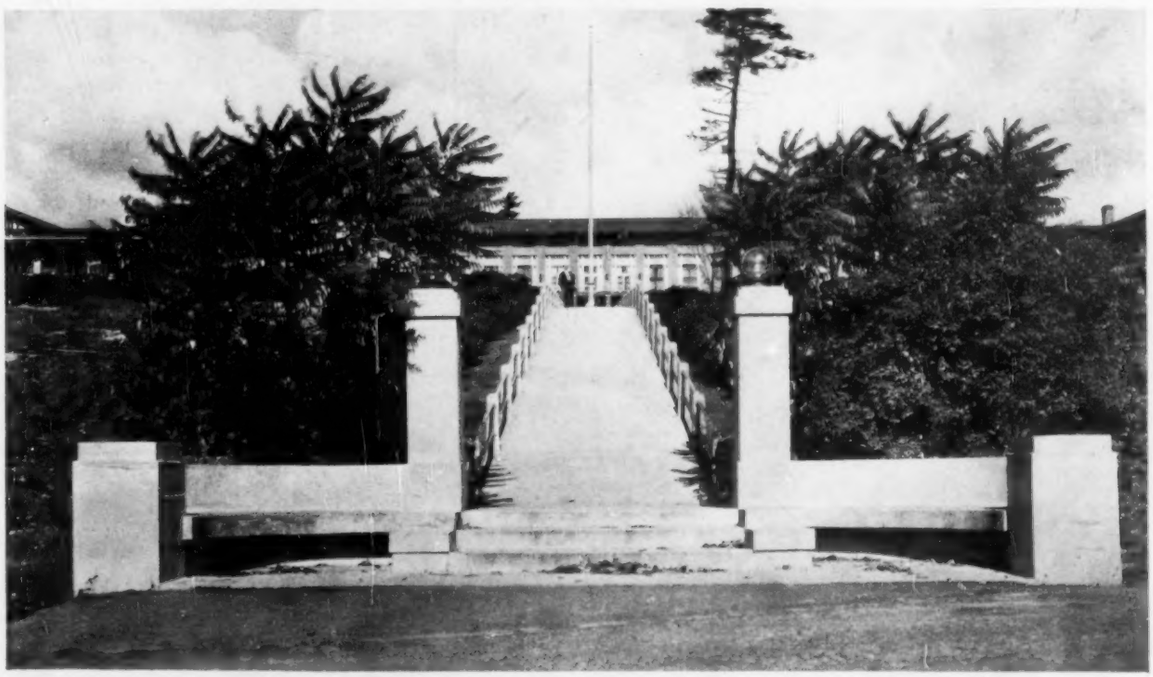
THE growth of industrial and other corporations in the United States during the last few decades to a point where the people employed by a single establishment number in the thousands, has gradually brought about a feeling of responsibility on the part of such corporations to their employees with respect to health and general welfare. This movement is to be heartily commended from a humanitarian standpoint, and it is not without its benefits from an economic standpoint as well, for it is necessary for the successful conduct of business to-day to have continuous and efficient effort, and this can only be had when all employees are in good physical condition and are assured pleasant recreation in their leisure hours.

One of the most carefully planned and conducted establishments for the benefit of employees is that of the Metropolitan Life Insurance Company in its large sanatorium at Mount McGregor, N. Y., located nine miles north of Saratoga Springs. The property has a commanding site comprising 500 acres, not including a large farm that is operated in connection with the institution. Looking toward the west from the sanatorium are the foothills of the Adirondacks; to the south, Saratoga Lake and the Catskills; to the east, Bemis Heights where one of the Revolutionary battles was fought, and in the distance the Green Mountains. The lake about which the group of buildings has been constructed is 1,046 feet above the sea level.



Main Floor Plan of Refectory

At the beginning of the project it was planned to care only for employees suffering from tuberculosis, and the site was selected in view of the qualifications best suited to the treatment of this disease. The plan had its inception in the winter

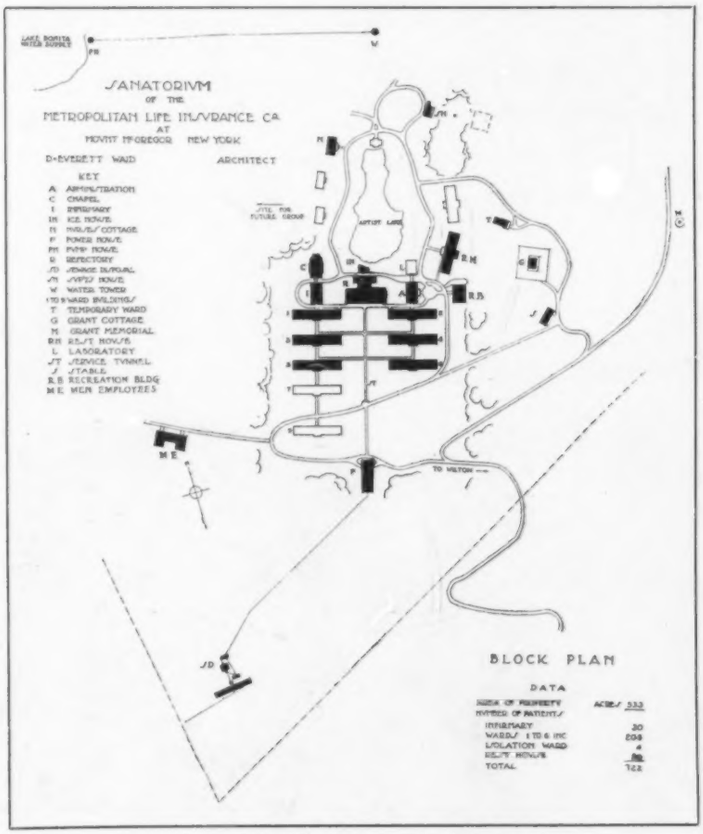


View Looking Up Path on Main Axis toward Refectory. The Tunnel Connecting Refectory and Power House Is Beneath This Walk

of 1908–9 at the time of the exhibition of the International Tuberculosis Congress in New York. A proposal following this exhibition that the Insurance Company should build and maintain a tuberculosis sanatorium for its employees met with the favor of the officers, and steps were taken to secure the consent of the state insurance department. There was some doubt expressed as to the right of an insurance company to enter into such a transaction, and the question was submitted to the Supreme Court, which declared that it was not only the right, but the duty, of such a corporation to take reasonable care of its employees without consultation with the stockholders.

View of Model Showing All Buildings Erected to Date

The employees of the Insurance Company number 16,000, and the plan of the group was arranged to provide accommodations for the number of tuberculosis cases arising among that number of people. The general treatment as followed in the sanatorium for the disease consists of rest, fresh air, diet and graduated exercise. The incoming patients are provided with single rooms in the infirmary until diagnosis is complete and constant bed treatment is found unnecessary. As recovery takes place the patient is removed to one of the ward buildings in the upper tier, which are provided with a diet kitchen, making possible continued or partial bed treatment when necessary. As recovery progresses the patient is moved to the lower wards, which are connected to the upper ones and the central group of buildings by inclined walks, so that by this means the strength of the patient gradually increases to meet the demands made on it. There are, however, in the vicinity of each of the buildings, level walks to provide exercise for patients whose condition will not permit climbing the grades. Extended roads lead to the surrounding woods and neighboring lakes. The main road leading to the sanatorium ascends for a distance of a mile, making grades varying from 6 to 10 per cent, which provide a means of testing the walking ability of patients before releasing them to return to their regular duties. This sanatorium is one of the few in the country from which patients may resume regular work after being discharged. It is possible, owing to the limited kinds of work that the employees ordinarily pursue, to provide them with such training during their convalescent period as will best prepare them for future work. The sanatorium has not been in operation long enough to prove the permanence of this preparatory treatment, but it has been demonstrated that the patient is able

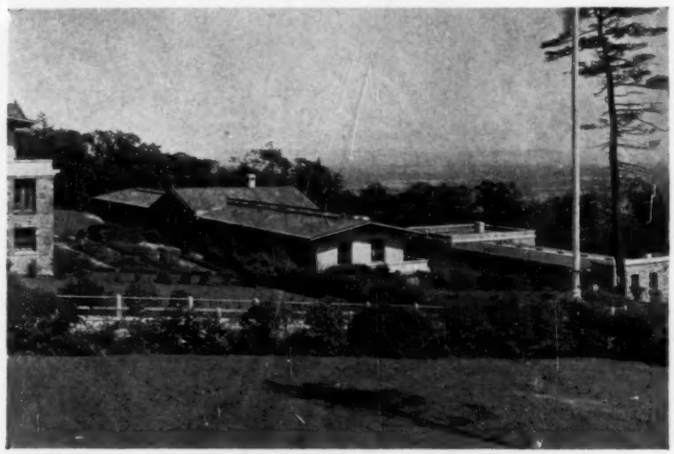


General Plot Plan of Sanatorium Property

to resume normal working conditions with the minimum of mental and physical effort and loss of weight, which are commonly experienced by recovered patients.

The sanatorium was opened to receive patients in November, 1913, but all of the wards and the administration building were not at that time erected. The group of buildings is now practically complete and is capable of accommodating 322 patients. The institution was not long in operation when it was realized that employees with other diseases would be benefited by the kind of treatment provided, and during the first year a few cases other than tuberculosis were brought to the sanatorium, and sufficiently good results were obtained to warrant the erection of a separate building for them, called "The Rest House," with accommodations for 80 patients. This building provides single rooms for such patients as require isolation, and double rooms and two dormitories for others.

View toward the South from the Ward Buildings



View Looking Southeast across Slope of Hill

The sanatorium consists of a group of three main buildings: administration, refectory and infirmary, with the patient's buildings, the several open wards and the rest house located on the southern slope of the site exposed to the prevailing southern breeze of summer and protected by the mountains and forest from the northern storms of winter. Although the buildings are located at different levels, they are so connected with graded walks that it is possible for a wheel chair or food cart to be run from any ward bed to the dining room or kitchen without passing a step.

The main driveway in front of the refectory is covered and connects the five central buildings, providing a level and dry outdoor walk in stormy weather and in fair weather an elevated terrace from which a magnificent panorama may be viewed. The ward buildings are a development of the so-called "shack" type of tuberculosis shelter. The patients' reclining chairs and beds are always out of doors but under roof. Each of the alcoves accommodates two beds, and at the rear of each space is a dressing room for two patients with a toilet between each two dressing rooms.

The alcoves were designed with a view of providing doors to close them, but in practice it has been found that, even in the most severe weather, they are unnecessary. Over each bed is a skylight with a non-closing ventilator which floods the bed with sunshine and also assures constant, upward circulation of air. The space immediately in front of the alcoves is enclosed with fly screens and provided with a low balustrade to protect the interior from driving rain and snow. The central portion of each ward building contains a social room and two tub bathrooms.

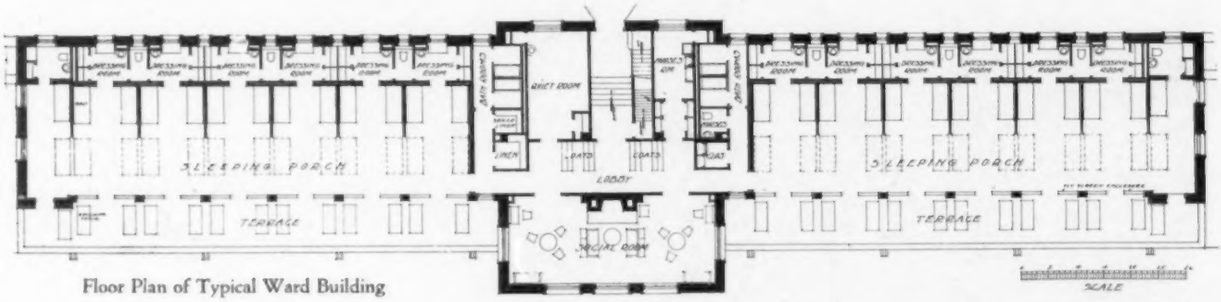
The administration building provides space for the physician in charge, his assistants, the business manager and clerical assistants. Adjoining

Rest House as Seen across Artist Lake

the main reception room are examination rooms with facilities for examining a large number of patients in the shortest space of time. The pharmacy from which medicines are distributed is located in the ground story, and here also is the hydrotherapeutic department with dressing rooms, steam heated cabinets, etc., planned to facilitate the use of this treatment. The upper portion of the building contains rooms for the members of the staff and guests, and a library and sitting room for their use.

The central and largest building of the group is the refectory, the ground floor of which is devoted to the use of convalescent patients in workrooms, library, etc., and also a press room for *The Optimist*, a weekly paper published by the patients. The front portion of the main floor of this building is devoted to the dining room—a room 32 feet wide and 132 feet long, with a vaulted ceiling 24½ feet high, and a range of windows commanding a view of the Hudson Valley and Saratoga Lake to the south. In the center of the building is a large double serving room and back of this are the kitchen and its dependencies. The second floor portion back of the dining room is set apart for female helps' sleeping quarters, and above this dormitory is an isolation ward with outside stairway designed to accommodate a nurse and three or four patients. Across the drive from the service portion of the refectory is the icehouse, adjacent to Artist Lake from which the supply is taken. This building has a capacity of 500 tons.

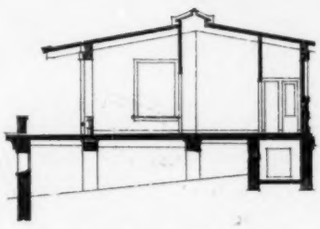
The infirmary, which is west of the refectory, contains in the basement on the level with the driveway at the south, waiting rooms, X-ray and drug room, autopsy room, etc. The first story on a level with the drive on the north contains, aside from separate bedrooms for incoming patients, a diet kitchen and surgical dressing room. The second story is similar to the first, but has in addition a serving room and small laboratory. A distinctive feature of the infirmary is the method



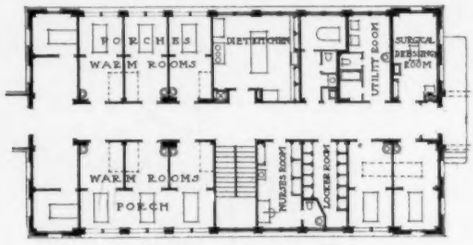
Floor Plan of Typical Ward Building

View of East Group of Ward Buildings from Main Driveway

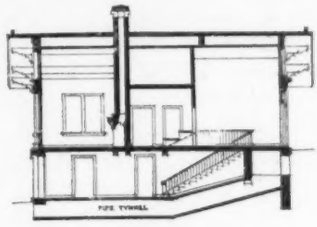
View Looking Up Main Driveway Showing Ward Buildings at Left and Recreation Building at Right



Cross Section through Dormitory Wings of Ward Buildings



Main Floor Plan of Infirmary



Section on Axis through Central Pavilion of Ward Buildings

of opening the entire exterior end of each room to the outer air, protecting it with louver shutters which permit free passage of air, but keep out to some extent the sun, rain and snow. If necessary, the windows can be closed and the room of the patient heated. At the rear of each patient's bed glazed doors enclose a portion of the room, which in cold weather is heated and used for meals, bathing and dressing.

The most recent addition to the group is the recreation building at the crest of the hill on the right of the entrance drive. It has a large auditorium suited to concerts and other entertainments at which the convalescent patients may gather.

The chapel is connected by a glass enclosed passage with the infirmary, from which bed patients may be wheeled into the gallery. A resident chaplain is provided with sitting room, bedroom and bath, in connection with the chapel.

The power house is located at the southern extremity of the plot and on the main axis of the refectory building. It contains the boilers and engine room, boiler feed pumps, emergency water supply pump and electric transformers, with space for possible future electric generators. Coal is delivered by motor truck into bins with a capacity of 700 tons, and finds its way by gravity from the driveway to the front of the boilers. Above the boiler room there is a fully equipped laundry and sterilizing room. The upper story of this building is a dormitory for male help, which has in addition a common sitting room. The lower floor of the building provides a garage and repair shop. The stack is built of solid concrete blocks reinforced horizontally and vertically with steel bars. Its inside diameter is 5 feet and it extends 175 feet above the boiler room floor.

A tunnel leads from the laundry floor of the power building up the hill to the refectory, a distance of 750 feet. An electric railway carries laundry work and supplies between the buildings, and in stormy weather, employees may use the tunnel as a passage. The tunnel, furthermore, contains pipe galleries for steam, water and drainage pipes, electric cables, etc., and from it branches are carried through underground conduits to the several buildings.

At the upper end of the lake and on the north-

west side is the nurses' cottage, within easy walking distance of the main group. Each nurse is provided with a single bedroom or sitting room if she prefers to use the common sleeping porch. A comfortable living room is a part of the first floor, which provides a center for the social recreation of the staff.

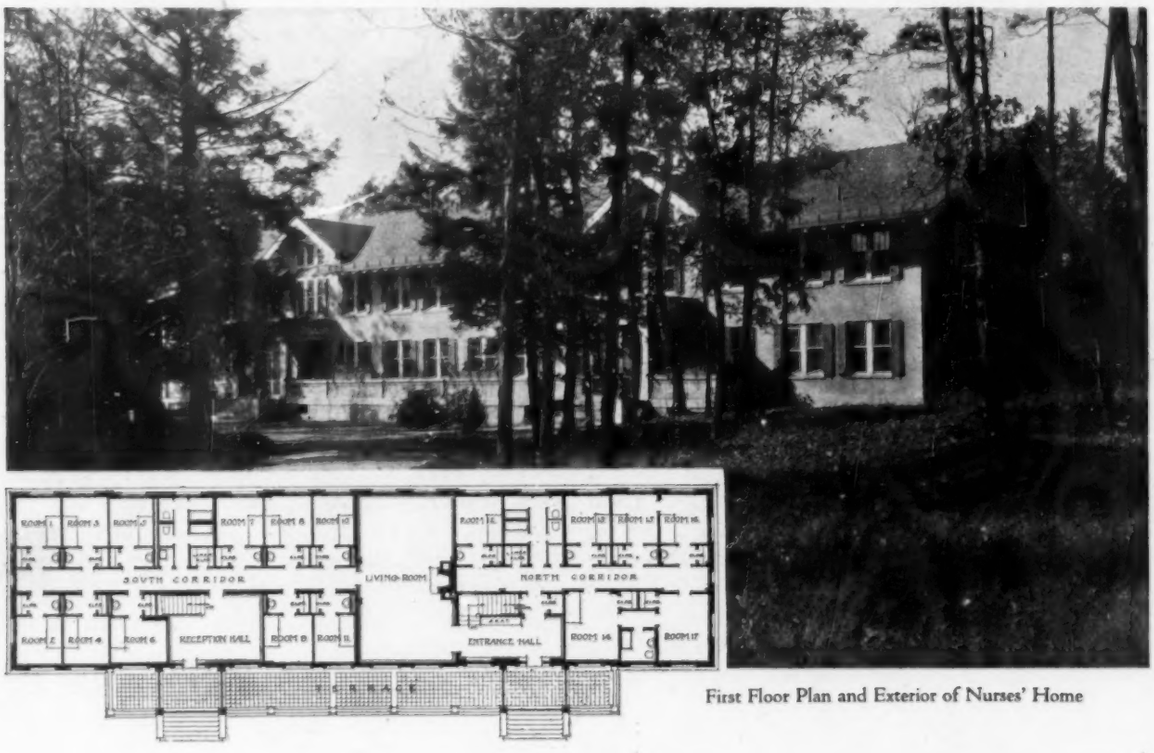
View of Power House from Upper Level

At the north is a reinforced concrete, 50,000 gallon water storage tank supported on a stone tower. The supply is taken from Lake Bonita, nearly a mile to the west, where it is treated with chlorin gas and from which it is pumped by gasoline pump to the water tower, aerated and filtered, and then distributed by gravity.

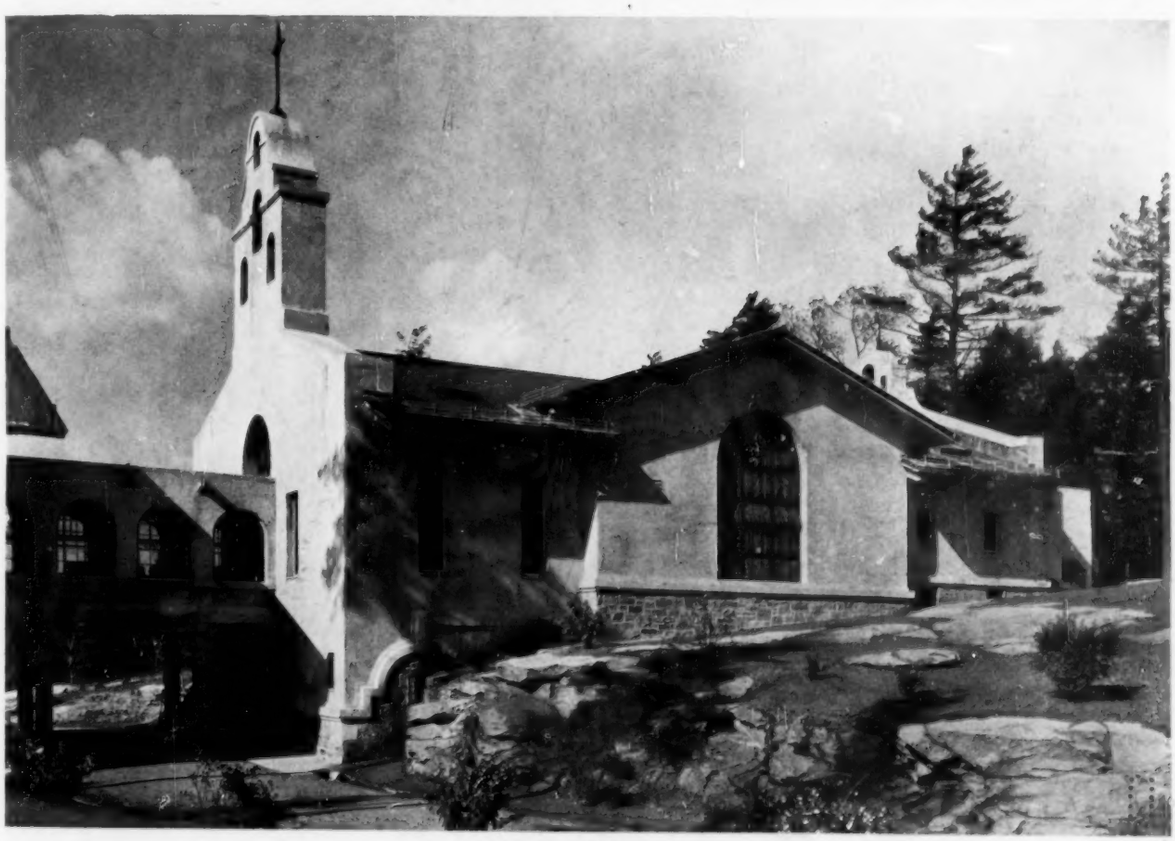
The sewage disposal plant is located at the lowest part of the site, well away from the buildings, and consists of settling tanks, sprinkling filter, sludge bed and sand filter beds. The effluent is treated finally with chlorin before it is passed into the neighboring stream. Electricity for light and power is obtained from the transformer station of the electric railroad in the neighboring town of Wilton. Hot water heating is used throughout the group, the water being pumped from the central plant through the tunnel and branches. The boilers also generate high pressure steam for sterilizing and use in the laundry, kitchen and various serving rooms.

The buildings have foundation walls of rubble stone, which was quarried on the site. The upper walls are of hollow tile with stucco surface. All floors and roofs are reinforced concrete, the roofs being covered with red tile. The finished floors in general are of Portland cement concrete, with the exception of the toilet rooms, which have vitrified white tile floors, the kitchen where green slate is used, the corridors which are covered with linoleum laid on the concrete, and the bedrooms of the rest house which have composition flooring.

An interesting fact in connection with the sanatorium is that the cottage in which General Grant died stands in the midst of the sanatorium property. The Metropolitan Life Insurance Company has erected on the brink of the cliff where General Grant had his last view of the valley, a memorial slab with suitable inscription.



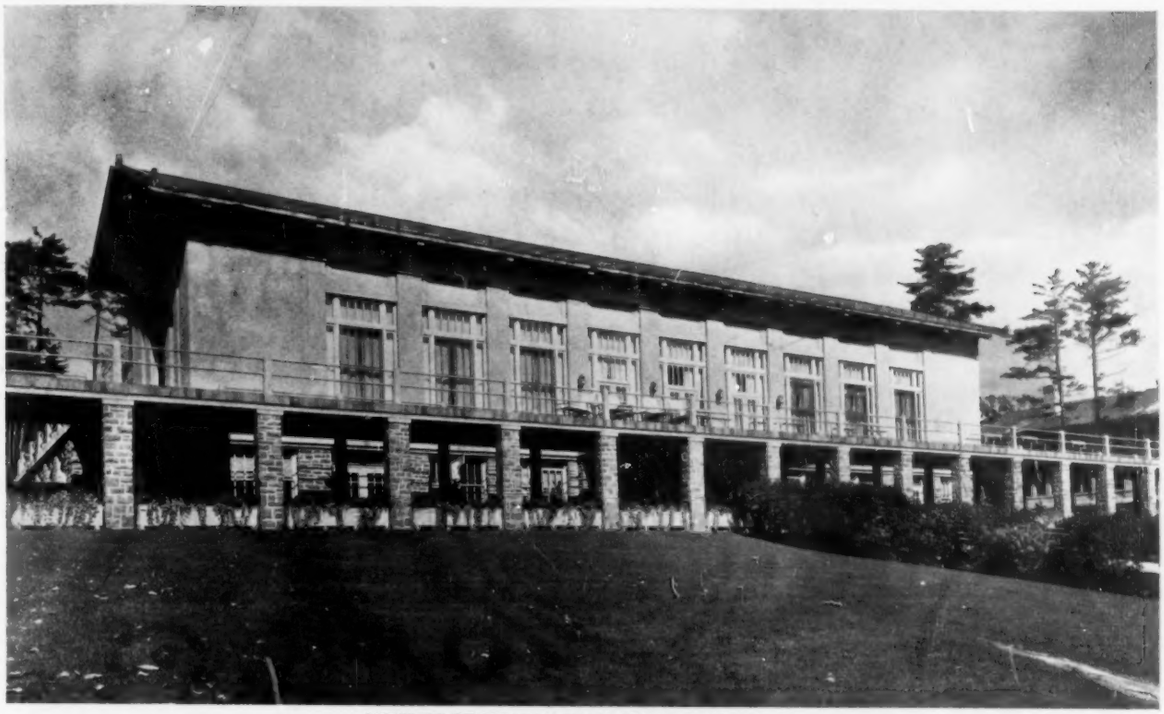
First Floor Plan and Exterior of Nurses' Home



TWO VIEWS OF THE CHAPEL

SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

D. EVERETT WAID, ARCHITECT



VIEW OF REFECTORY FROM WARD BUILDINGS

INTERIOR VIEW OF REFECTORY

SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

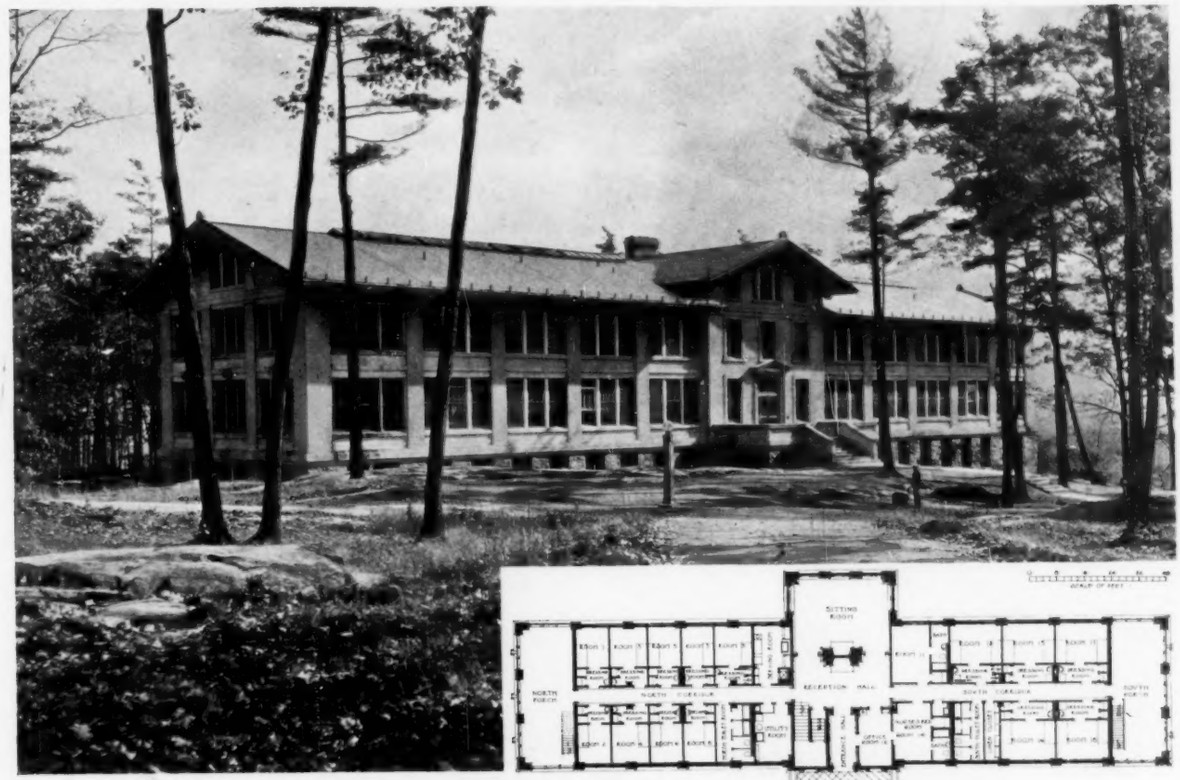
D. EVERETT WAID, ARCHITECT

VIEW OF REFECTORY FROM REAR OF ADMINISTRATION BUILDING

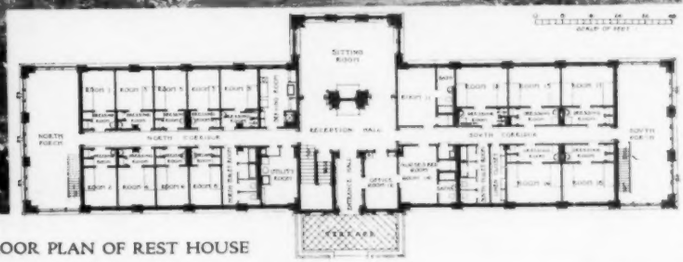
ENTRANCE FRONT OF SUPERINTENDENT'S HOUSE

SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

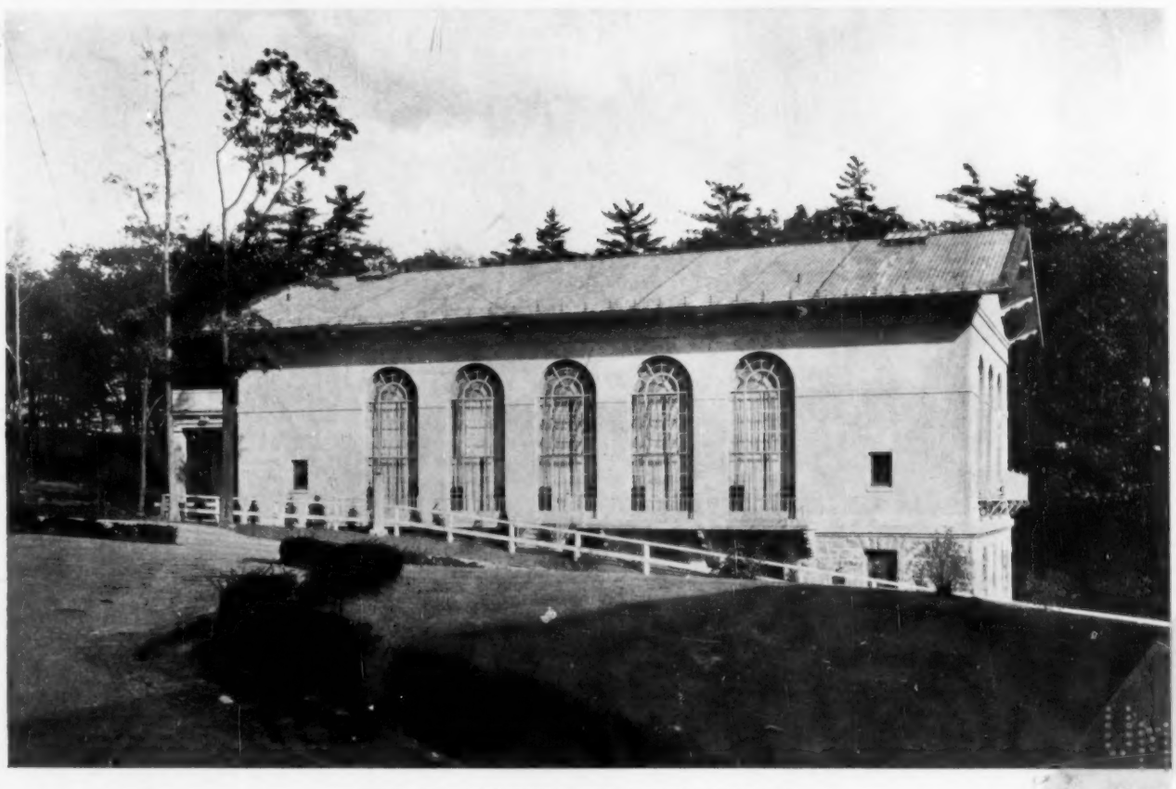
D. EVERETT WAID, ARCHITECT



GENERAL VIEW OF REST HOUSE



FIRST FLOOR PLAN OF REST HOUSE



RECREATION BUILDING FROM MAIN APPROACH

SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

D. EVERETT WAID, ARCHITECT

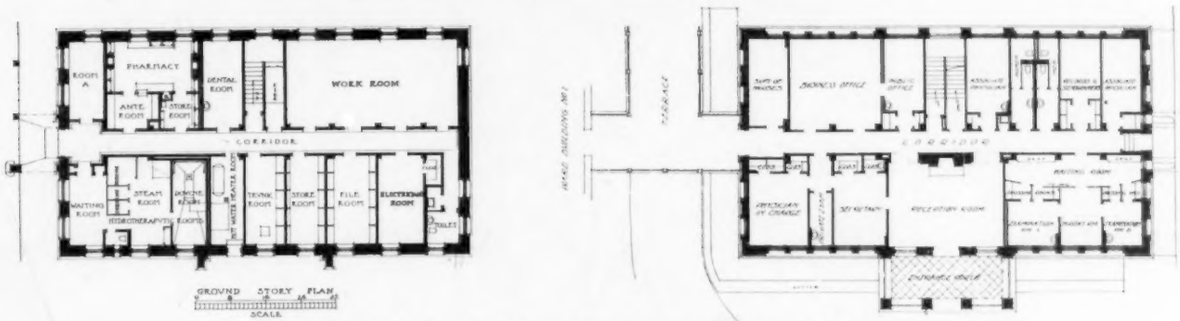
VIEW OF WARD BUILDING IN UPPER GROUP

VIEW OF WARD BUILDING IN INTERMEDIATE GROUP

SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

D. EVERETT WAID, ARCHITECT

WARD BUILDING IN INTERMEDIATE GROUP FROM MAIN APPROACH



GROUND AND FIRST FLOOR PLANS OF ADMINISTRATION BUILDING

ADMINISTRATION BUILDING SHOWING SERVICE END OF REFECTORY AT RIGHT

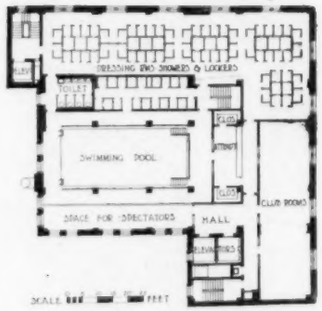
SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

D. EVERETT WAID, ARCHITECT

Y. W. C. A BUILDING, 53D STREET AND LEXINGTON AVENUE, NEW YORK, N. Y.
DONN BARBER, ARCHITECT

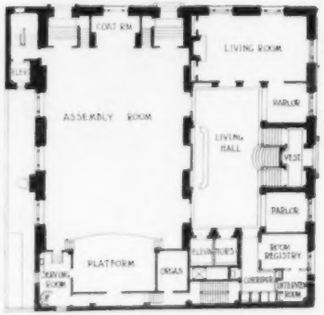
EIGHTH FLOOR PLAN

TENTH FLOOR PLAN

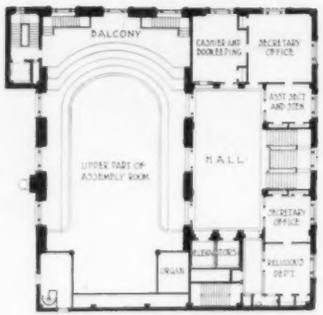


FOURTH FLOOR PLAN

FIFTH FLOOR PLAN



FIRST FLOOR PLAN

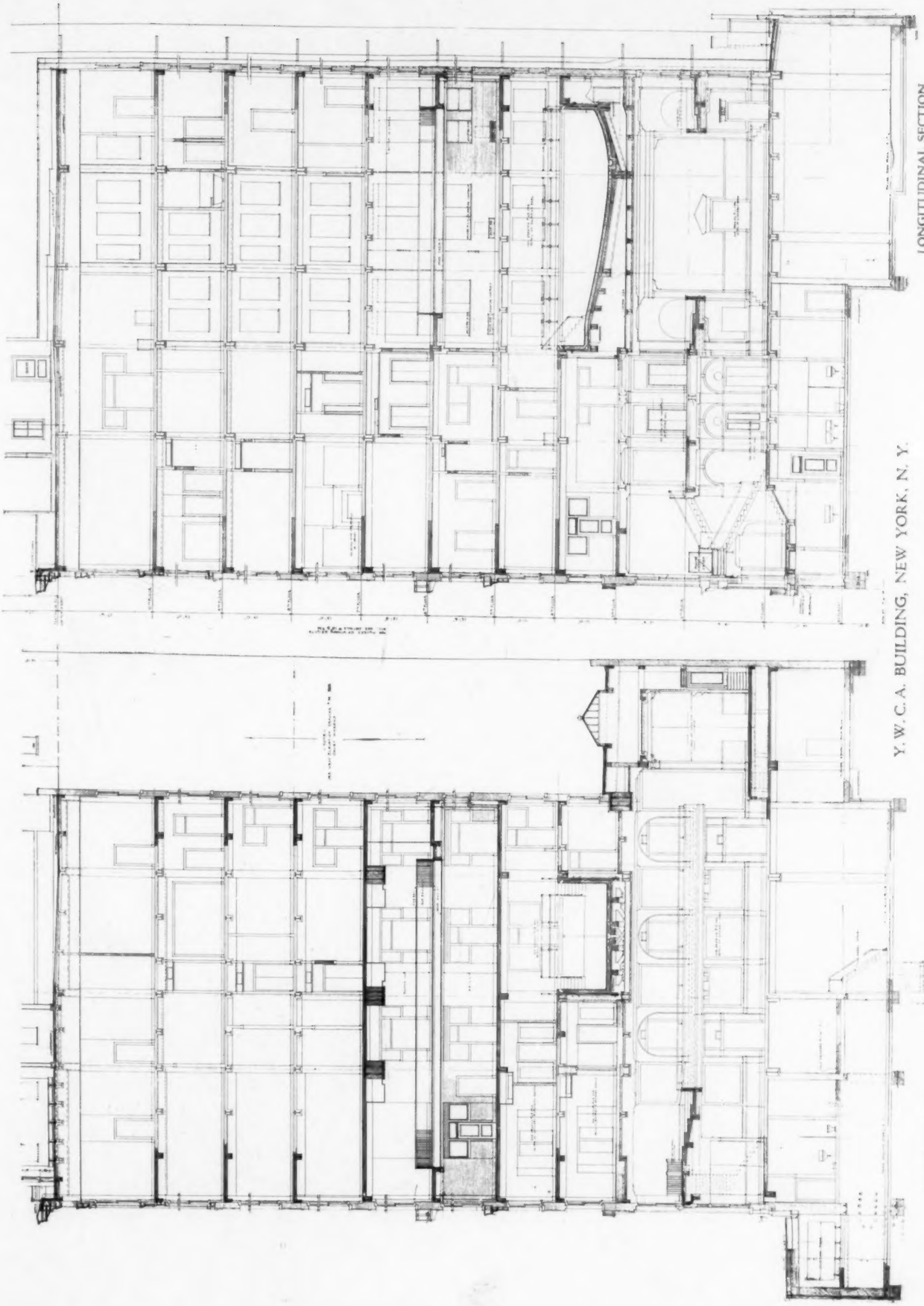


SECOND FLOOR PLAN

DETAIL OF MAIN ENTRANCE

Y. W. C. A. BUILDING, 53D STREET AND LEXINGTON AVENUE, NEW YORK, N. Y.

DONN BARBER, ARCHITECT



LONGITUDINAL SECTION

Y. W. C. A. BUILDING, NEW YORK, N. Y.

DONN BARBER, ARCHITECT

CROSS SECTION

LIVING ROOM ON FIRST FLOOR

DESK IN ENTRANCE HALL

DETAIL OF ASSEMBLY HALL

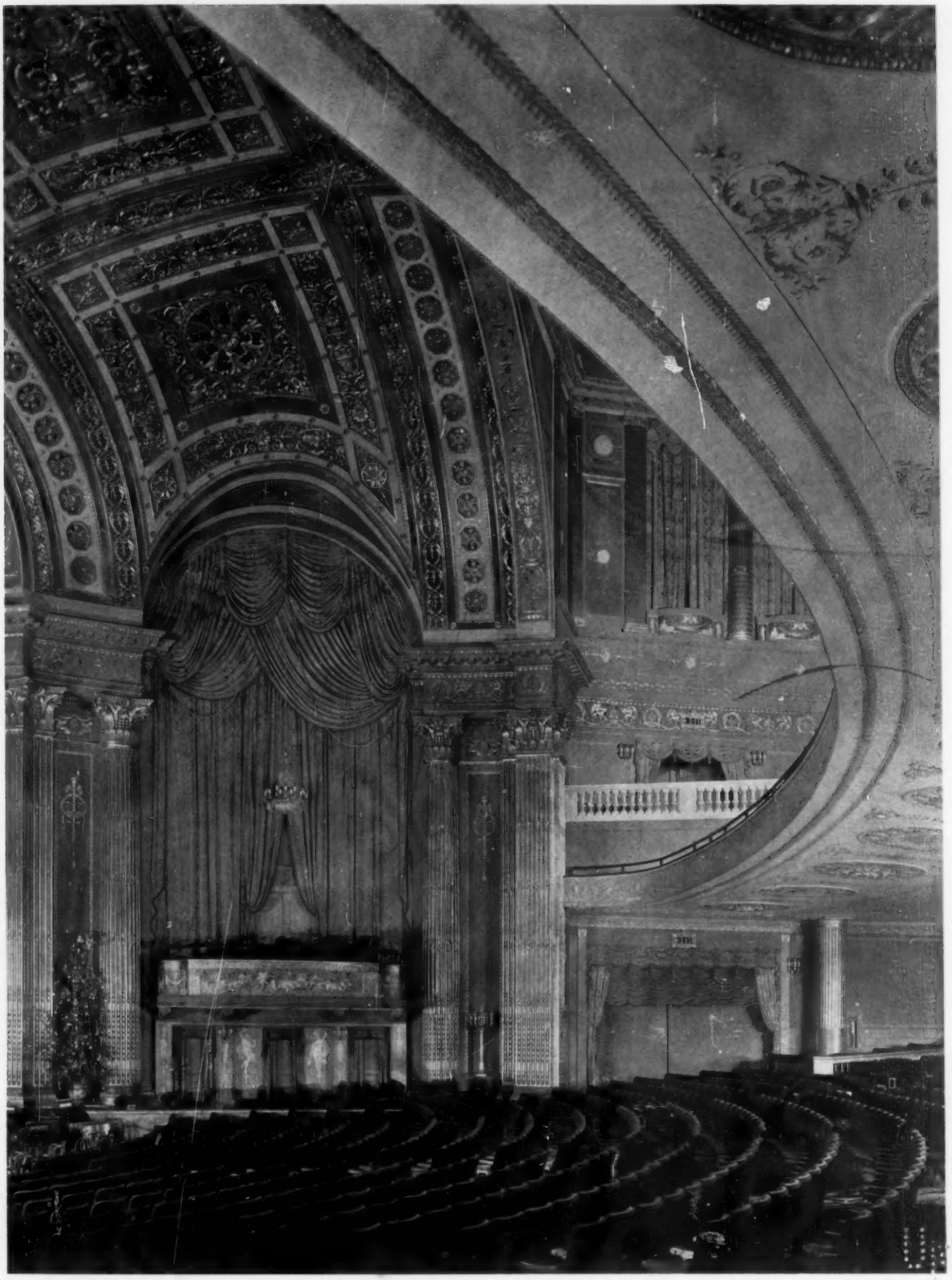
Y. W. C. A. BUILDING, 53D STREET AND LEXINGTON AVENUE, NEW YORK, N. Y.

DONN BARBER, ARCHITECT

DETAIL OF MAIN LOBBY

CAPITOL THEATER, NEW YORK, N. Y.

THOMAS W. LAMB, ARCHITECT



VIEW OF BOX FROM ACROSS PARQUET

CAPITOL THEATER, NEW YORK, N Y

THOMAS W. LAMB, ARCHITECT

DETAIL OF PROSCENIUM OPENING

CAPITOL THEATER, NEW YORK, N Y

THOMAS W. LAMB, ARCHITECT

DETAIL OF BOX

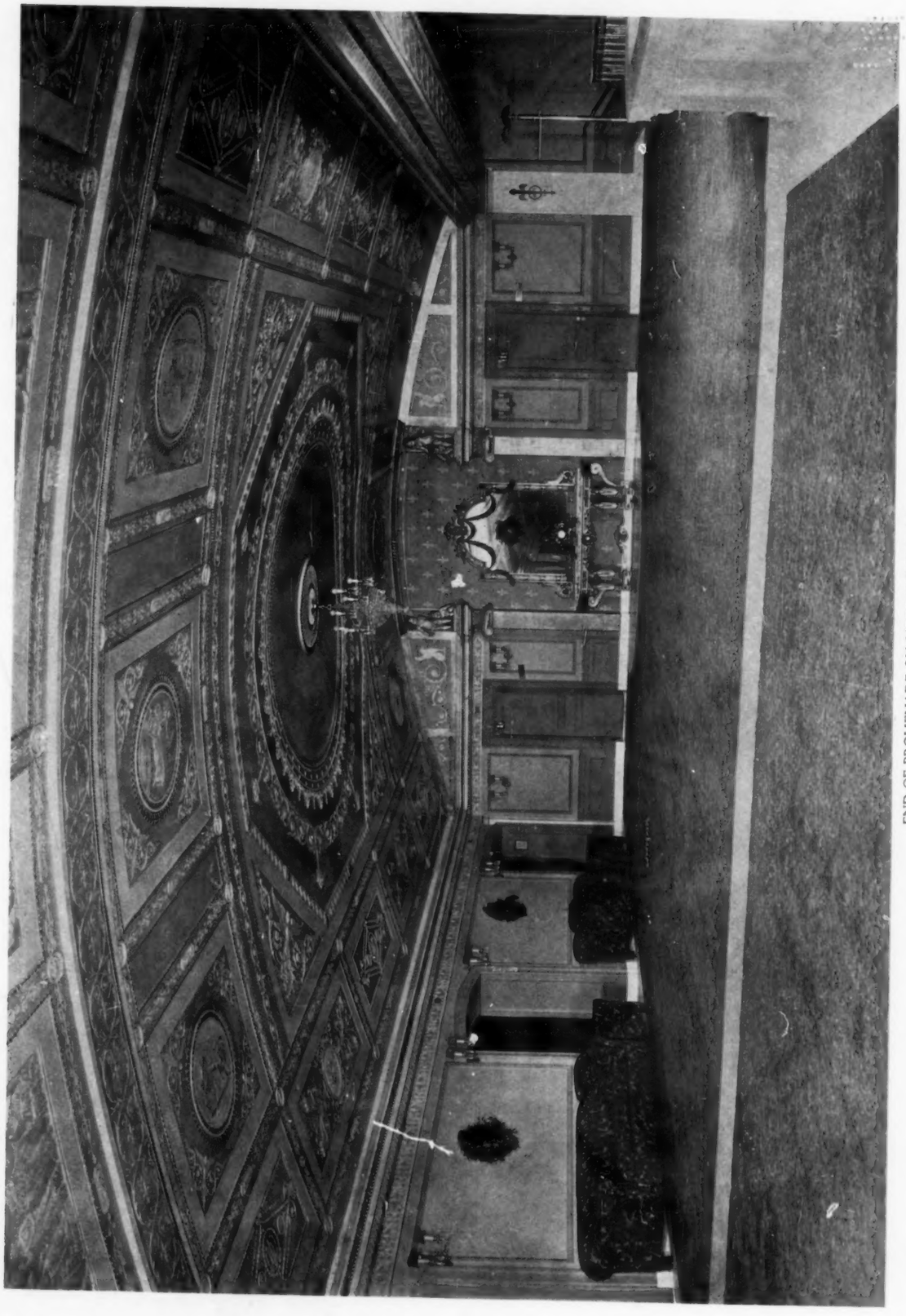
CAPITOL THEATER, NEW YORK, N. Y

THOMAS W. LAMB, ARCHITECT

DETAIL OF SIDE WALL AND CEILING

CAPITOL THEATER, NEW YORK, N. Y

THOMAS W. LAMB, ARCHITECT



END OF PROMENADE ON MEZZANINE FLOOR
CAPITOL THEATER, NEW YORK, N Y
THOMAS W. LAMB, ARCHITECT

The Capitol Theater, New York, N. Y.

By EMIL M. MLINAR
Of the Office of Thomas W. Lamb, Architect

THE Capitol Theater is the newest notable addition to New York's extensive range of theaters and is remarkable in many respects. It commands attention first because of its great size; it is the largest theater in New York and probably, as its owners claim, the largest in the world. This is readily shown by its seating capacity which is 5,230, over 600 more than the Hippodrome, seating 4,623, and until now the most imposing theater of New York. Perhaps more astonishing is that this immense auditorium is devoted in the main to the display of motion pictures, disputing for all time the theory held by many a few years ago that the motion picture would never achieve such popularity as to rival the spoken drama.

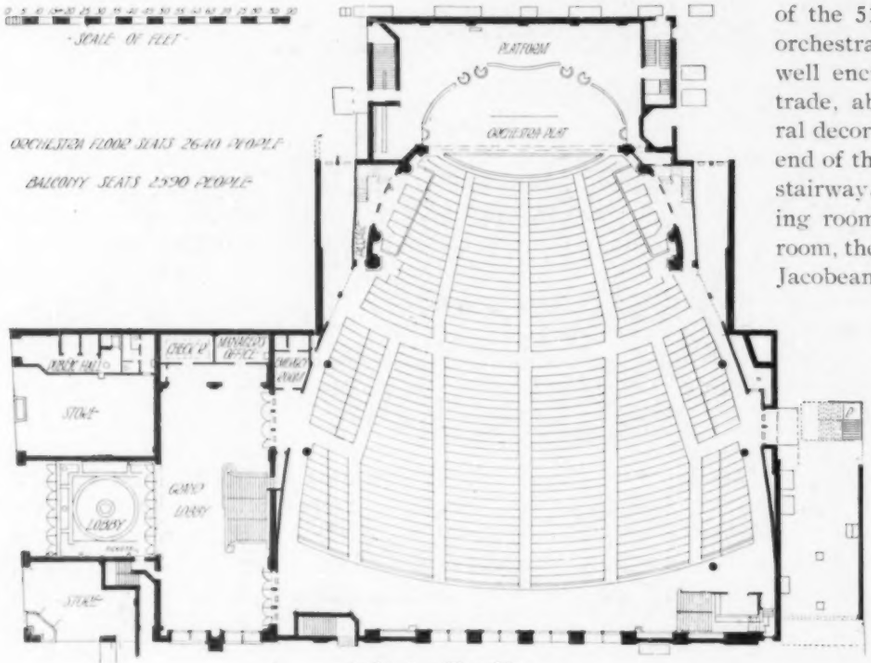
The building is interesting from an architectural standpoint because of the unusual and difficult type of construction employed, and the manner in which so colossal an interior has been decorated to achieve the intimate effect essential to a successful theater.

The building is located on upper Broadway on a plot formerly occupied by buildings of the old type that furnished a rendezvous for scenic artists, writers and other professionals in search of atmosphere. The area occupied by the building is in the shape of an inverted L, the Broadway frontage of 100 feet 6¼ inches being one extremity, the 51st street side with a frontage of 268 feet 11 inches the adjacent side, and the depth from 51st to 50th streets of 200 feet 10 inches comprising the other side, the frontage on 50th street running forward toward Broadway for a distance of 137 feet. It is in this large rear portion of the plot that the theater proper is located, with the stage on the 50th street side. The portion fronting on Broadway is used for the principal entrance and monumental lobby, with the upper floors given over to offices. The exterior of the structure is treated in the usual manner as an office building masking the auditorium, depending solely on the exterior opening to the lobby to indicate the purpose of the building. The classic motif of the Broadway façade is continued along 51st street to form the rear wall of the auditorium.

The big problem in designing the theater was encountered in the auditorium. This is of a scale found in but very few interiors; its size may be realized in that the orchestra floor seats 2,640 people—a full capacity for the average large theater—and that the single balcony seats 2,590 additional people. The choice of a style for the decoration was most important, and in selecting that of the Empire period, the dominating consideration was the desire to have dignity and to depart from the academic coldness which prevails in many periods, particularly as the design must enfold an expanse of interior, yet at the same time must counteract the depressing effect that is bound to result from area.

The entrance lobby, with marble walls, is treated in soft colors, almost pastels, *café au lait* shades predominating, and gold covering the stucco or plaster ornamentation. This gold is glazed with soft green to produce an Etruscan effect. Elsewhere it is a Roman gold with relief ornamentation glazed and rubbed into a cameo effect. This

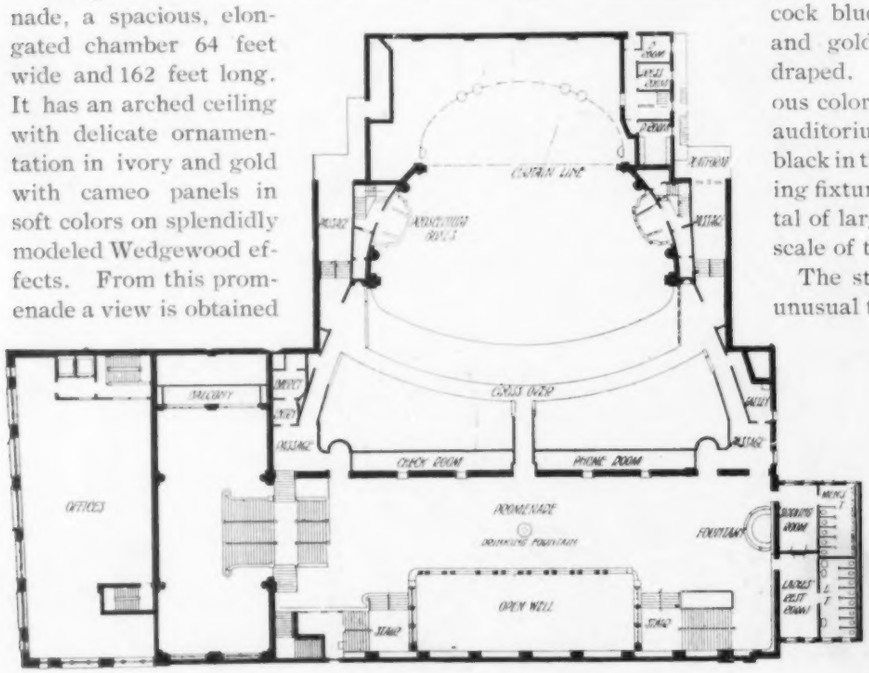
View of Interior from Stage Showing Great Size of Auditorium



Auditorium Floor Plan

lobby leads to the main foyer, which spreads out luxuriantly to right and left, and gives access to a wide Italian marble staircase on the main axis. The walls of dark walnut rise to a beautiful ceiling of rich ornamentation in Roman gold with *cafe au lait* tints. Five great panels enclose murals of unusual interest and beauty, the work of an American artist, William Cotton.

The great staircase leads to the grand promenade, a spacious, elongated chamber 64 feet wide and 162 feet long. It has an arched ceiling with delicate ornamentation in ivory and gold with cameo panels in soft colors on splendidly modeled Wedgewood effects. From this promenade a view is obtained of the 51st street entrance to the orchestra floor, through an open well encircled by a marble balustrade, above which is a large mural decoration 72 feet long. At the end of the promenade opposite the stairway are located the men's smoking room and the ladies' retiring room, the former carried out in the Jacobean period, and the latter a charming example of Louis XV design. Entrance to the lower part of the balcony is had through openings along the left wall of this gallery.



Mezzanine Floor Plan

The auditorium is decorated in a color scheme of *cafe au lait* with Roman gold ornamentation. The side walls are treated most successfully with a highly decorative Ionic order contrasting with richly colored hangings. The ceiling is composed of a large central dome, 64 feet in diameter, containing figured panels in soft colors, and surrounding it are ten smaller domes from which various lighting effects are obtained. A richly decorated sounding board is supported over the proscenium by a grand order framing the state boxes, which are reached from the orchestra floor. The hangings consist of peacock blue silk damask with putty and gold figures, most carefully draped. The carpets are of various colors, — black and gold in the auditorium, and old rose, gold and black in the promenade. The lighting fixtures throughout are of crystal of large size, to accord with the scale of the interior.

The structural steel design is of unusual type because of the great balcony. The absence of visible supports on the main floor for this large overhang is due to the use of a system of cantilevers projecting from the main balcony truss in a direct line 28 feet and diagonally 40 feet. These trusses are designed to reduce vibration to the minimum. They have been em-

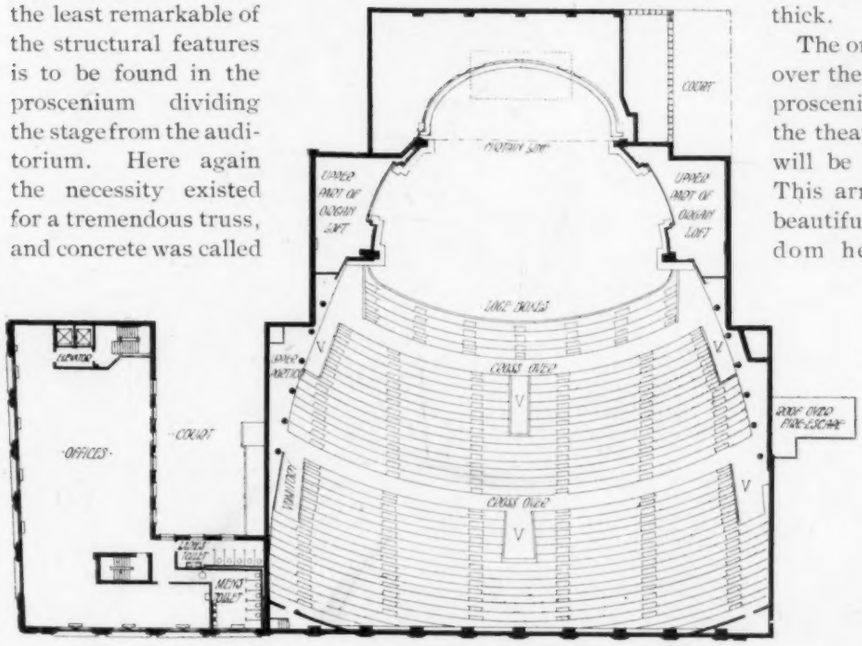
ployed in a few earlier buildings, but never before on so large a scale ; this overhang extends 40 feet at the minimum — the center line of the balcony.

The main balcony truss is 160 feet in length, 16 feet 6 inches high, and weighs more than 100 tons. It extends from east to west on the 51st street side of the building, acting as the principal support for the series of cantilevers on which the balcony rests. It is supported at either end by a huge column 6 feet within the building, leaving an unbroken and unsupported span of nearly 160 feet. This tremendous sweep is one of the factors that contributes largely towards the atmosphere of airiness and lightness characteristic of this colossal theater.

Exterior View Showing Broadway and 51st Street Facades

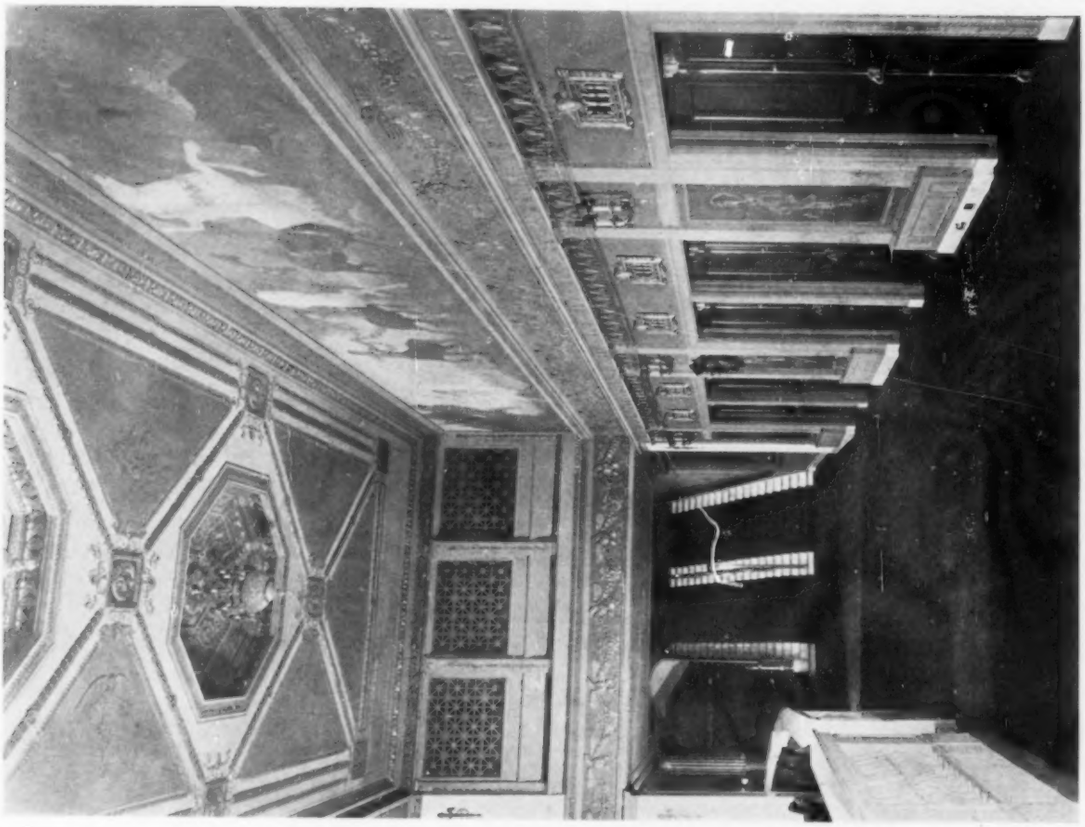
There are other trusses within the building which are worthy of notice, especially in view of war-time conditions under which they were built. A system of eleven trusses, each with a span of 120 feet, supports the roof. These are 21 feet high at one end and taper to 14 feet at the main roof truss. The latter is 30 feet 7 inches in depth and has a span of 100 feet.

Some conception of the magnitude of the structural problems that had to be met is possible through understanding that 1,100 tons of steel were employed. Not the least remarkable of the structural features is to be found in the proscenium dividing the stage from the auditorium. Here again the necessity existed for a tremendous truss, and concrete was called into requisition to minimize the demand for steel. The proscenium opening itself is 61 feet wide and 50 feet high, and the truss in question spans this vast opening. A supporting pier at each side is made of reinforced concrete, 3 feet thick, 6 feet wide, and towering 76 feet high. At a point 50 feet above the stage floor the truss was poured in the same dimensions, closing the proscenium opening at the top and providing a solid truss 72½ feet wide, 26 feet high, and 3 feet thick.

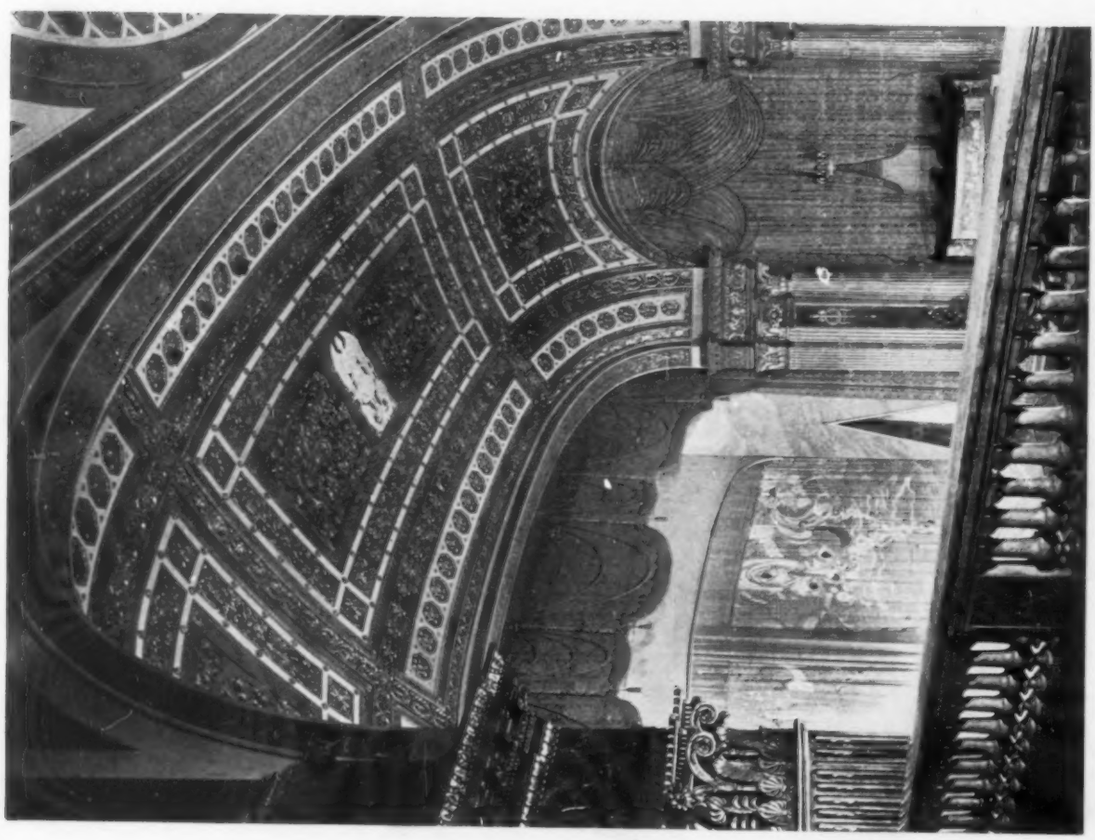


Balcony Floor Plan

The organ chambers are situated over the boxes just in front of the proscenium arch on either side of the theater, and the two divisions will be separated about 100 feet. This arrangement makes possible beautiful, antiphonal effects seldom heard in theaters. The thought uppermost was that the organ should bear the same relation to the theater that exists between a large cathedral and its organ. Although more than ordinarily rich in fundamental tone, it contains many stops of a novel character, and nothing has been omitted that would be useful in playing pictures.



View Showing Exits to 51st Street from Auditorium



View of Proscenium and Sounding Board

CAPITOL THEATER, 51ST STREET AND BROADWAY, NEW YORK, N. Y.
Thomas W. Lamb, Architect

Young Women's Christian Association Building, New York, N. Y.

DONN BARBER, ARCHITECT

THE Central Branch Building of the Young Women's Christian Association of the City of New York is situated at the southwest corner of Lexington avenue and Fifty-third street. The size of the lot on which the building stands is 100 by 103 feet, and the structure is ten stories high above the street level, with basement and sub-basement below the street. This building, together with the National Board Building of the Y. W. C. A. erected in 1912, occupies the entire block front on Lexington avenue between Fifty-second and Fifty-third streets.

The National Board Building is twelve stories high and its façades are entirely of limestone in Renaissance style, inspired in its forms and details from the Italian. It is, generally speaking, an administration building.

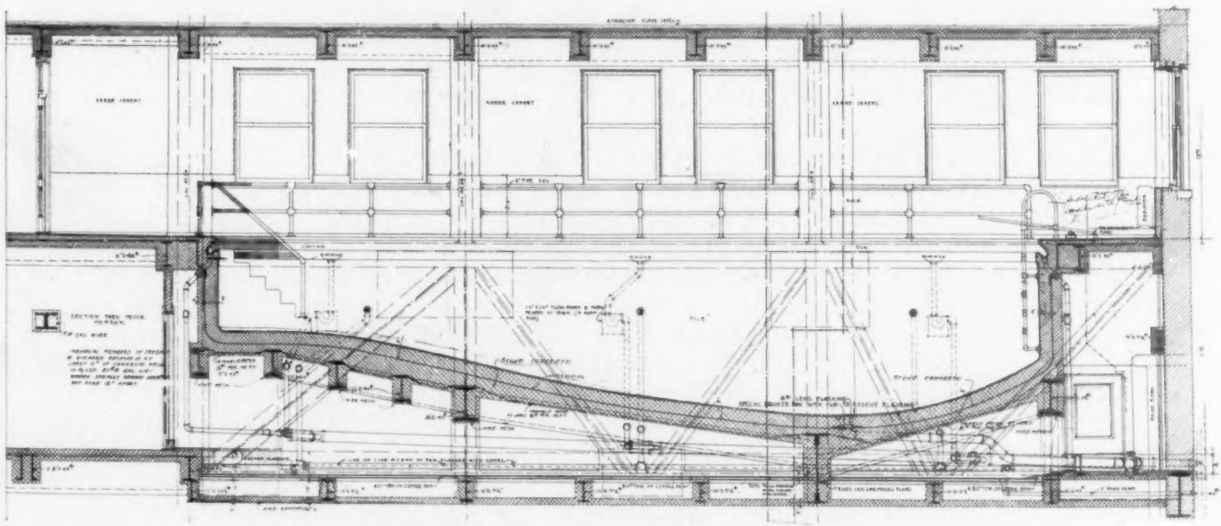
The National Board and the Central Branch, though both association buildings, are, however, entirely dissimilar both in their functioning and in their general style. They are two distinct types with nothing as to arrangement or use in common, though they are practically of equal volume and importance. It was the wish of the Y. W. C. A. Council that these two buildings should in no way resemble each other; that they should represent in their façades different entities and indicate as far as possible that their functions, and relation to association work are distinctly different.

Donn Barber, who designed the National Board Building, was chosen to be the architect for the newer Central Branch structure, and in carrying out the wishes of the committee he has produced façades for the Central Branch Building of brick, limestone and terra cotta, which are treated again in a free Renaissance style and conform to and are in harmony with the National Board Building, though frankly differing from it.

The monumental character and materials permissible and desirable in the National Board Building are in no way reflected in the newer structure, though the base and certain cornice and band courses have been carried through. The Central Branch, which is the largest women's club building in the city, has been designed and built in such a way as to furnish a model of simplicity and directness, arrangement and equipment, and is of strictly economical cost of construction. The building in composition and treatment, inside and out, is of an up-to-date, institutional type and is handled with unusual and admirable restraint and sense of practical fitness. Many special features of interdependence and logical relation hitherto untried or achieved in buildings of this type have been studied and ingeniously worked into the general scheme, greatly to its benefit, and in their successful solution these should serve as precedents in the development of future buildings.

In studying the plan arrangement, careful consideration was given to the possibility of future extension of the building to the west, or adjoining the assembly and gymnasium side of the building.

The disposition of space in the building is shown in the reproduction of the floor plans on Plate 8, but a few notes may explain them more fully. The principal feature of the first floor is the large main assembly room, which is 80 feet long by 50 feet wide and 30 feet high. It runs up through



Detailed Section Through Swimming Pool on Fourth Floor

two floors and has generous direct exits to Fifty-third street. On the Lexington avenue side of the second floor are located the executive offices, connected by a central reading and lounging room, which in turn connects with the gallery level of the assembly room. The third floor contains a series of club rooms on the Lexington avenue side of the building capable of being opened into one another, and completely separated from these on the Fifty-third street side is the lower tier of dressing, locker and shower rooms, which extend up through two stories. On the fourth floor over a portion of the assembly room is the swimming pool with its visitors' gallery, having direct access from the main hallway. On the fifth floor is located the gymnasium, a room equal in size to the assembly room and again over it. The gymnasium runs up through two stories and is amply provided with light and air from three sides—an admirable and unusual feature in buildings of this kind. The sixth floor gives access to the visitors' gallery of the gymnasium and contains the board of directors' room, social and work room, and the department for trained attendants with its dressing and work room and diet kitchen. The seventh floor contains the library and its dependencies, employment department with waiting room and interview rooms, offices and class rooms. The eighth floor is given over in its entirety to a series of class rooms for typewriting, stenography, bookkeeping, etc. The ninth floor is used again for class rooms and work rooms for teaching trades and a model flat for household arts. The tenth floor contains a large cafeteria, a cooking school and its various dependent services, and rest room.

The building considered as a whole is, generally speaking, divided into three quite separate sections, or departments, the lower portion of the building being given over to social work, the central portion to physical development, and the upper portion to educational interests. These three services are distinct in themselves, but their proper interdependence and their practical intercommunication has not been lost sight of. Many hitherto unsolved, detailed problems of a technical nature have been arranged for in this building, and in its operation they have proven to be eminently practical and satisfactory in many new ways for the handling of Association work. In its design, furnishings and fittings, the building is unusually plain and free from any elaboration. Circulation problems are simple and meet the building laws governing such questions, directly and adequately.

Perhaps the one outstanding novel feature of the building is the position and arrangement of the gymnasium department and its direct private communication to the dressing rooms, locker rooms and the swimming pool. Ordinarily in such buildings the pool is placed in the basement and lighted only, or principally, by artificial light, and ventilated by forced means. Here the necessity for heavy steel at the third floor level to span the assembly room has suggested and brought about an arrangement of high trusses into and between two of which has been harnessed the pool construction. These trusses carry the assembly room ceiling, the pool and the floor of the gymnasium. The heavy columns which support these trusses carry on up through the gymnasium and in turn carry lesser trusses spanning the gymnasium, and these final trusses carry the columns for the upper five stories of the building. By this arrangement the heavy loads and spans are all taken care of in one section of the building, leaving the remaining framing quite simple and normal.

As rock was found at about what has been taken for the basement level on the site, a considerable rock excavation at high cost would have been necessary if the pool and its dependencies had been placed, as is usual, below grade. It was decided to save the cost of rock excavation and to apply some of the saving on extra steel. The final cost of the building shows that this scheme has produced not only a substantial financial economy, but it has made practical the placing of the athletic and physical department well up in the building where it is possible to get abundant air and light.

Another most successful feature is the detailed arrangement of the showers, dressing rooms and locker spaces that make their use adaptable for widely varying numbers in attendance, with no crowding or confusion resulting from their use by the larger numbers.

Fully detailed reports of the activities housed and their practical handling in this building would tell the real story of this building and its adaptability from the Association point of view, in daily use, and, if space permitted of such data being presented here, it would be most interesting.

Finally, the building contains its own heating, power and lighting plant of such generous size that it not only supplies its own requirements, but furnishes heat and light to the twelve-story National Board Building next door.

The original contract for the building was let at a cubic foot rate of about 27 cents. The power plant, including generators and motors, was an after consideration and brought the cost of the finished building up to about 30½ cents; adjustments made to the contractor on account of the increased cost of labor and materials due to war conditions brought the total cost of the building up to about 32 cents per cubic foot, exclusive of furniture and equipment.

Interior Decoration

THE PERIOD OF LOUIS XIV

By MATLACK PRICE

THE decorative side of architecture is yearly becoming a matter of increasing interest and study to the architect who, in many cases, has added to his ancient office of master builder that of interior decorator.

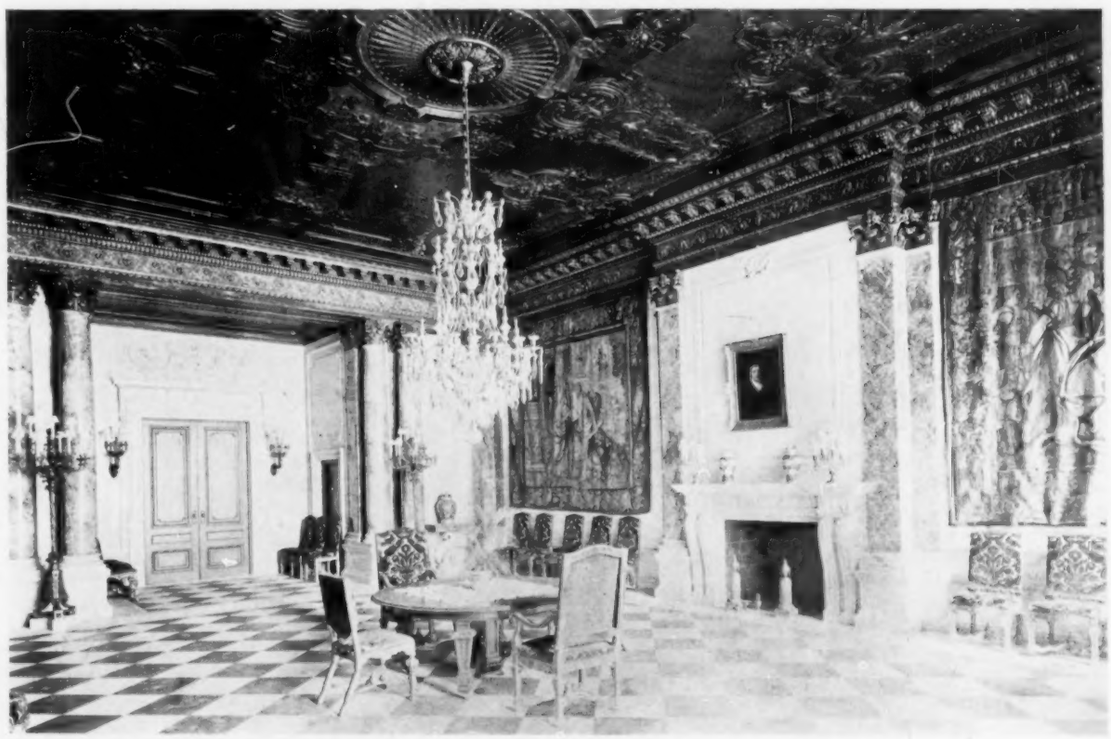
Because of this, and because the greater part of the architecture of this country finds its derivation from historic European styles, it is increasingly necessary that an extensive study be made of period design and of the decorative accessories associated with the periods.

It is no longer enough to possess a reasonable familiarity with the style of Renaissance Italy, of the periods of the French Louis XV and XVI, and with the principal English periods of decoration.

The practice of period decoration has progressed so far that it is now important, and even essential, to be familiar with the various minor phases and sub-styles of the periods, as well as with certain entire periods which, for one reason and another, have not figured very extensively in modern adaptation in this country. Among these might be enumerated the art, architecture and furniture of Renaissance Spain, the Baroque style in its several forms, the styles of Francis I, Louis XIV and the Empire and Directoire in France. There are also a few discoveries to be made in England and in this country.

It is the purpose of the present article to bring out a few points on one of the least understood of the French styles — that of Louis XIV, a style largely misunderstood and seldom adequately appreciated. This style is usually regarded as unsuited to present architectural uses largely because of the ornate and heavy character of most of the furniture of the period; but when studied from an architectural angle, certain qualities of merit are perceived which are not at first apparent.

The usual approach is backward, with the style first seen from a position of comparative familiarity with the styles of Louis XV and Louis XVI; whereas a real understanding can only be reached by working toward the style of Louis XIV from



Dining Room in the New York City Residence of the Late John Jacob Astor
The Furniture is Distinctly in the Style of Louis XIV, in Modern Adaptation, as Well as the Ceiling and the Entire Effect of the Room
Richard Morris Hunt, Architect

the beginning of the French Renaissance, in the early sixteenth century.

Thus, under Louis XII, French architecture, both exterior and interior, is seen to be essentially Gothic, with beginnings of Italian forms — forms more characteristic of the Italian Renaissance than of Classic precedent. As in the Ducal Castle at Nancy (1501–1512) it was common to see pilasters decorated with Italian Renaissance arabesques and terminating in Gothic pinnacles. Parts of Blois were built at this time, and the great château was extensively altered and enlarged under Francis I, the famous stairway being added at that time. It was the period of great châteaux, like Chambord, retaining a good deal of medieval character, but tending ever toward the urbanity and modernity of the later châteaux of France.

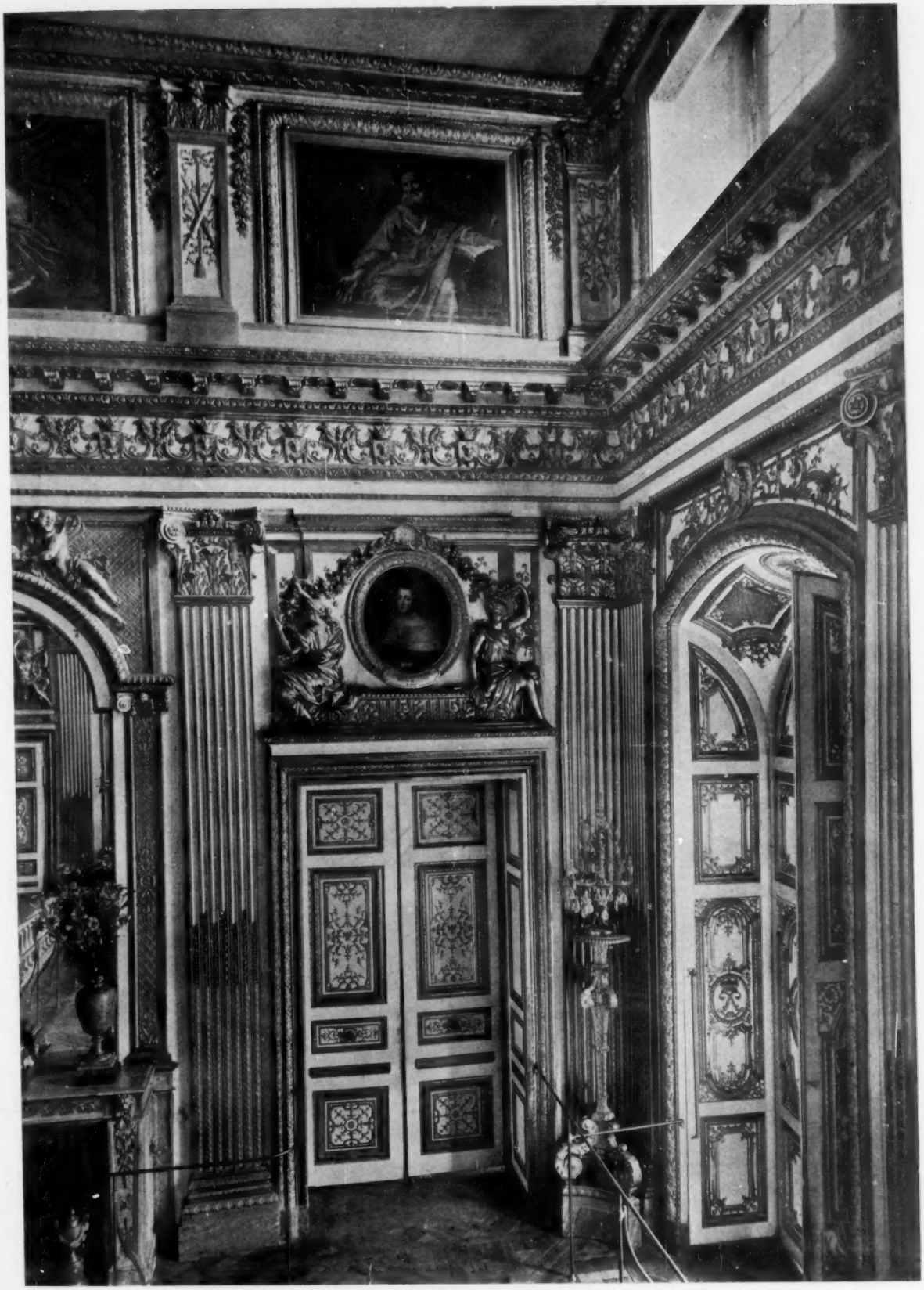
Doorway, Salle des Gardes de la Reine,
Palace of Versailles

There was still much distinctly Gothic architecture in the buildings of this period — they were, in fact, Gothic buildings embellished with Renaissance details, the balance constantly tending to grow greater on the Renaissance than on the Gothic.

The style known as Henry II (1530–1590) began to show departures from that of Francis I three years before the accession of Henry to the throne, for Francis died in 1547. The Henry II period in architecture and decoration carried through the reigns of Henry II, Francis II, Charles II and Henry III, and grew ever more and more toward a complete expression of Renaissance ideas. It was not at all unnatural that this should have been the case, for Francis I had introduced many Italian artists and artisans into France, and the influence of these was strongly augmented by the Renaissance enthusiasm of the numerous French architectural students who had gone to Italy to learn what they could of the far famed genius of Italy's great humanistic revival. There was, furthermore, the powerful court influence exerted by the queen, Catherine de' Medici, who was married to Henry II in 1533 and, until her death in 1589, showed a continuous interest in architecture and the fine arts, and naturally in Italian styles and workmanship.

The displacement of Gothic forms by Renaissance classic forms, which had been gradual but continuous since the time of Louis XII at the beginning of the century, thus gained a new impetus, and by the close of the reign of Henry II scarcely a trace of Gothic feeling remained. The architectural stage was being cleared for another battle of styles, which was to commence in the reign of Henry IV and culminate in the reign of Louis XIV.

Meanwhile, buildings of essentially Italian character were the rule; as, for example, the Hotel d'Assezat, in Toulouse, the gatehouse of the Château of La Tour d'Aigues, and the court of the Château of Bourmazel. Philibert de l'Orme was one of the greatest architects of the period, and the Château of Chenonceaux, as enlarged by him, one of his greatest works. At Fontainebleau, too, De l'Orme did extensive work, and his influence was widely felt by other architects of the period. Two other great names of the period were Jacques

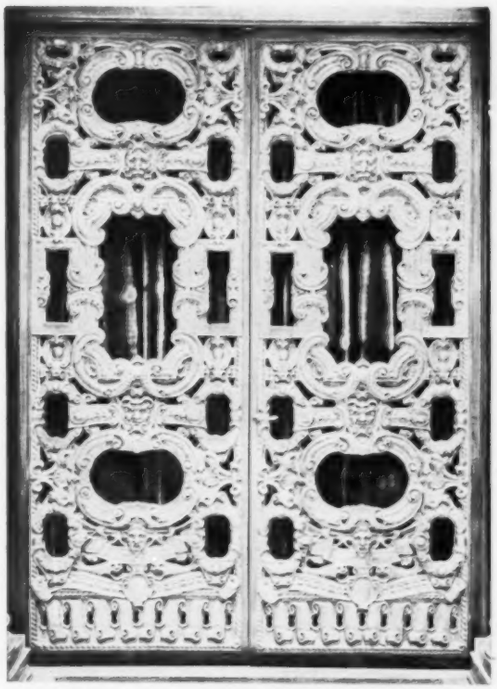


Chamber of Louis XIV, Palace of Versailles

du Cerceau and Jean Bullant, the former a facile designer of furniture and mantels. Primaticcio, the Italian, always in favor with the De' Medici Italian Queen Catherine, was given complete control of all court architectural projects, as well as of all allied arts and industries.

Following the now distinctly classic style of Henry II came that of Henry IV, which continued through the reign of Louis XIII and culminated in the style of Louis XIV.

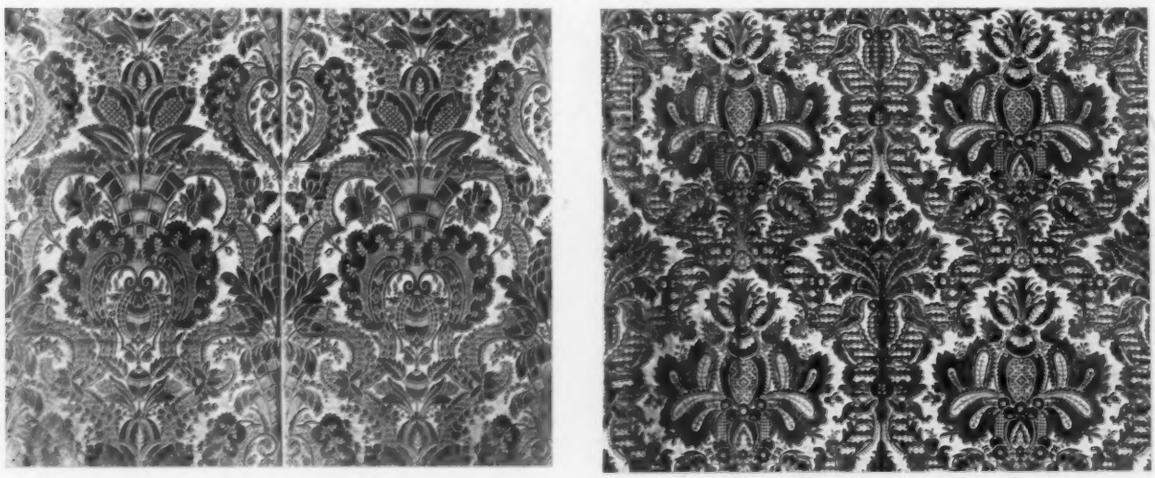
With no trace of the Gothic style now remaining, a new competitor against the classic spirit appeared in the form of the Baroque, which, in Italy, was symptomatic of the overripening of the Renaissance. Under Louis XIII architecture and decoration became noticeably Baroque in character, and the classic ideal, still struggling against Baroque through the period of Louis XIV, became submerged in the Louis XV wave of Rococo, to emerge, at last triumphant, in the superb and gracious style of Louis XVI. The style of Louis XIV is given as extending from 1643 to 1715, while the monarch's long and glorious reign comprised the years between 1640 and 1710. In England these years were occupied by six reigns: the two Charles, the Commonwealth, the second James, William and Mary and Queen Anne.



Pair of Doors in a Modern Version of that Type of Italian Baroque which was One of the Most Conspicuous Component Parts of the Style of Louis XIV
Howells & Stokes, Architects

Architecture and decoration under Louis XIV are broadly divided into two sub-styles: the first being a compromise between Palladianism (the name accorded to the Italian-classic style) and the Baroque; the second, that gorgeous and dramatic style characterized by "the Grand Manner."

It was a period of direct patronage and control of art by the Crown; it was "le Grand Siècle," when France reached her maximum of national unity, power, prosperity and magnificence. It was a period of brilliant life at the court, of brilliant achievements in architecture, art and literature. The three sub-periods of the reign divide its architecture as well as its general life. First, the forces of the nation prepared for the succeeding era of greatness, systematically gathering under the sole direction of the Crown all the national activities and resources. Following this was the period of culmination, which lasted until 1680, and which saw the armies under Louvois winning for France a dominating place among the nations, while Colbert was effecting the same result through the systematizing of politics, administration, literature and art. The inevitable decline, which de-



Examples of Modern Damask Inspired from Louis XIV Originals

veloped gradually from 1680 to 1690, followed the death of Colbert in 1683. The highly efficient organization of the government at last brought the reaction of a general wish for less dictation and less control. It was Louis XIV who said, with entire truth, "*L'etat, c'est moi*"; but the State, in time, found such an identity to be highly uncongenial, and the official control of the nation's activities grew constantly less.

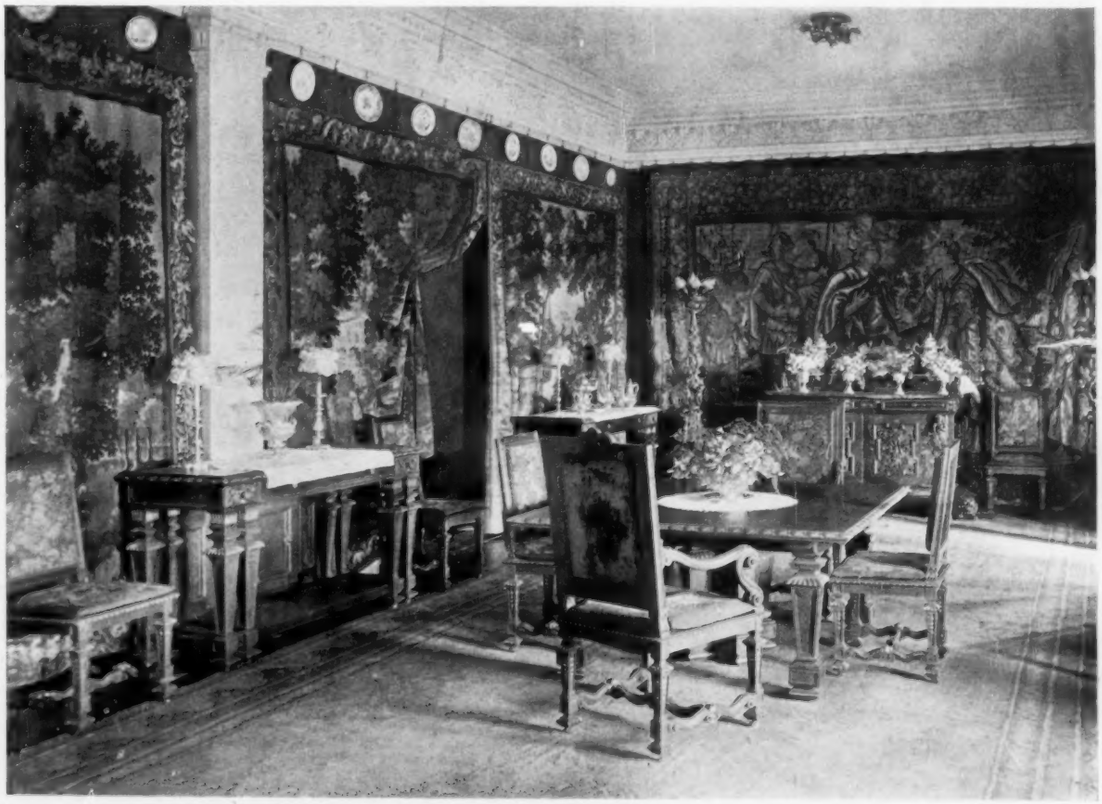
During the first part of the period all design showed far greater unity and concentration than in any part of the preceding period, with the classic spirit, or "Palladianism," generally in the ascendant. All the arts related to architecture, as well as architecture itself, received the same impetus of lavish patronage by wealth and power that brought the culmination of the Italian Renaissance, and during the height of "le Grand Siècle" of "le Grand Monarque," Louis XIV, the energies of architects, cabinet makers, decorators and textile industries were dedicated to the creation of magnificent palaces, chateaux and public monuments, with Versailles the center of interest. The close of the period saw a strong tendency on the part of the artists and the art schools to free themselves from the restraints of official dictate and the State's prescribed uniformity of artistic production.

The intention of the State in assuming control of the art and architecture of the country was not only to make complete its dominance of national activities, and secure for its own uses the greatest contemporary talent, but also to achieve works which would reflect credit and glory upon the King and his Court. The Colonnade of the Louvre, the Dome of the Invalides, the Gate of St. Denis and the Palace and gardens of Versailles are typical of the results of this policy.

Colbert was appointed as the Court Architect and director of all kinds of artistic production, and his duties comprised "reviving or founding royal manufactures, housing and protecting native artists or sending them to study abroad, importing artists and models for imitation, painstaking industry in the conduct of the royal building operations, and the decoration and furnishing of palaces and public edifices."

France, instead of Italy, soon became the originator and arbiter of decorative style. While the style of Louis XIV, in monumental work, was inclined to be classic (in certain forms rather than in true architectural purity), the style in decoration showed more of a conflict between Italian Renaissance "Palladianism" and Italian Baroque.

Being based, however, on the rationalistic ideals



Dining Room in an American Country House Showing Direct Application of Louis XIV Forms in the Furniture

Armchair of Louis XIV Period Showing Italian Influence

of Henry IV, the style of Louis XIV was a highly "finished" style, rich and perfect in detail, and plainly showing a big sense of architectural design in large projects. It was a thoroughly French version of Italian classicism.

The decorative fabrics of the period — tapestries, damasks, brocades and velvets — were rich and elaborate and as thoroughly in "the Grand Manner" as the painting and architecture of Louis XIV.

The furniture, as seen in a few typical examples from the Metropolitan Museum in New York, was thoroughly characteristic of the prevailing ideals of magnificence. The square and decidedly "architectural" legs of this table were one of the distinguishing features of the furniture of the period, and are seen again in modern reproduction in the tapestried dining room shown in one of the illustrations.

One of the two armchairs from the Metropolitan Museum, shows distinct elements forecasting the style of Louis XV, while the carved corbel is distinctly Renaissance in character.

It was under Louis XIV that Boule * created his famous cabinets and tables with rich and superbly carved ormolu mounts, and Jean and Daniel Marot designed great decorative tables and other pieces of furniture.

* Also spelled "Boulle" and "Buhl," and the work sometimes called "Buhl work."

The furnishing of the luxurious châteaux of the period called for a great variety of rich decorative accessories besides furniture and fabrics. There were massive and elaborate clocks, bronzes, chandeliers, sconces, screens and mirrors. The marble tops of consoles and tables held great porcelain vases of superb fineness.

Frequently among the decorative objects which were so profusely designed and manufactured in the great period of Louis XIV are seen pieces which clearly forecast the coming style of Louis XV — pieces which indicate an imminent reaction from the grandeur and formality of "le Grand Siècle" to a spirit of abandon and frivolity.

Before developing some thoughts upon the message of the architecture and decoration of the period of Louis XIV to the architecture and decoration of to-day, a word remains to be said on the subject of decorative textiles.

Fabrics began to take on rich and grandiose character under Louis XIII, reaching the height of sumptuous splendor under Louis XIV. Patterns for the most part were inspired by the decorative art of Renaissance Italy, but gradually developed in the direction of motives of a more national and contemporary sort. The design of gardens about the great châteaux had come to be such a distinctive achievement of the period that many suggestions of trees in full leaf, arbors, baskets of flowers, and even vistas of formal gardens, began to appear in decorative textile designs.

Armchair of Louis XIV Period

But this style of Louis XIV, great, complex, splendid, monumental, is regarded as a thing which holds no meaning for us to-day, no inspiration, or suggestion.

Has it no meaning for our architects and decorators?

Architecturally, there was a bigness of concept which is rare to-day—an ability to think in vast but well ordered terms. Le Vau had this large vision, and Le Pautre and De l'Orme and Mansart.

Carved Wood Corbel of Louis XIV Period

The palace of Versailles, vast as it was when Le Vau's work upon it was complete, was more than doubled by Mansart. Much of the interior architecture was the work of Le Brun, including the grand staircase, rich in marbles, bronzes and mural paintings, and the Galerie des Glaces, so recently one of the settings for the great Peace conclave.

The interior decoration of the great buildings of Louis XIV was far more architecturally planned than is most similar work to-day. Ward, the great English authority on French Renaissance architecture, tells us that "the decoration of a room is a clearly thought out and carefully balanced scheme, distributed into large, well defined divisions, and these sometimes divided into smaller compartments." And "the subjects of the paintings and enrichments contribute to the symbolic meaning of the whole scheme as much as their form and color to its decorative effect. There is an intellectual quality, a spirit of order and organization in Louis XIV decoration, which is as characteristic as its pomp and sumptuosity."

Is any "intellectual quality" strikingly apparent in the greater number of our large buildings? Have we even, in any case, copied these great old masters with such conspicuous intelligence as to entitle us to criticize their works?

Have we to-day any practicing architectural scholars of the type of Julien Mauclerc, Du Cerceau, Bullant, the Marots or Blondel? The folios of these earnest architects, illustrated with the most exquisitely detailed engravings, held ever before the eyes of their colleagues and pupils the eternal verities of the classic principles of architecture as opposed to the strong counter-attraction of Baroque.

Times are different to-day, it is true, and no architect could find time to execute a hundred or so large copper-plate engravings embodying his convictions upon architecture. But is the *spirit* in existence to-day? The books of these old masters are used to-day for reference and for inspiration, even though we take the stand that their works hold no practical possibilities for contemporary architecture. Where is the thoroughness of these early architects?

And where, too, is their versatility and their fertile invention? Le Pautre and many others made a practice of showing *projets* for ceilings in which the drawing is divided into quarters, and in each is exquisitely drawn an "alternate" scheme each quite different from the others, and all four of such striking merit that it would be difficult to select the best one from among them.

Where is the patronage of art and architecture which accomplished such profuse and varied works? Is there any individual in this country to-day corresponding to Colbert, who sent students and draftsmen to Italy to learn Italian architecture and return with it to France? Not only did

Carved and Gilded Table of Late Louis XIV Period

Colbert send students to Italy, but he saw to it that such students and draftsmen as remained in France had the benefit of such instruction as was available at the time, and were provided with living and working quarters. He also coordinated the manufactories and industries which produced decorative accessories, subsidizing them where necessary, and ever directing and encouraging the development and progress of national arts of every kind. Times have changed — yes — but let us not look with a too patronizing superiority upon the period of Louis XIV.

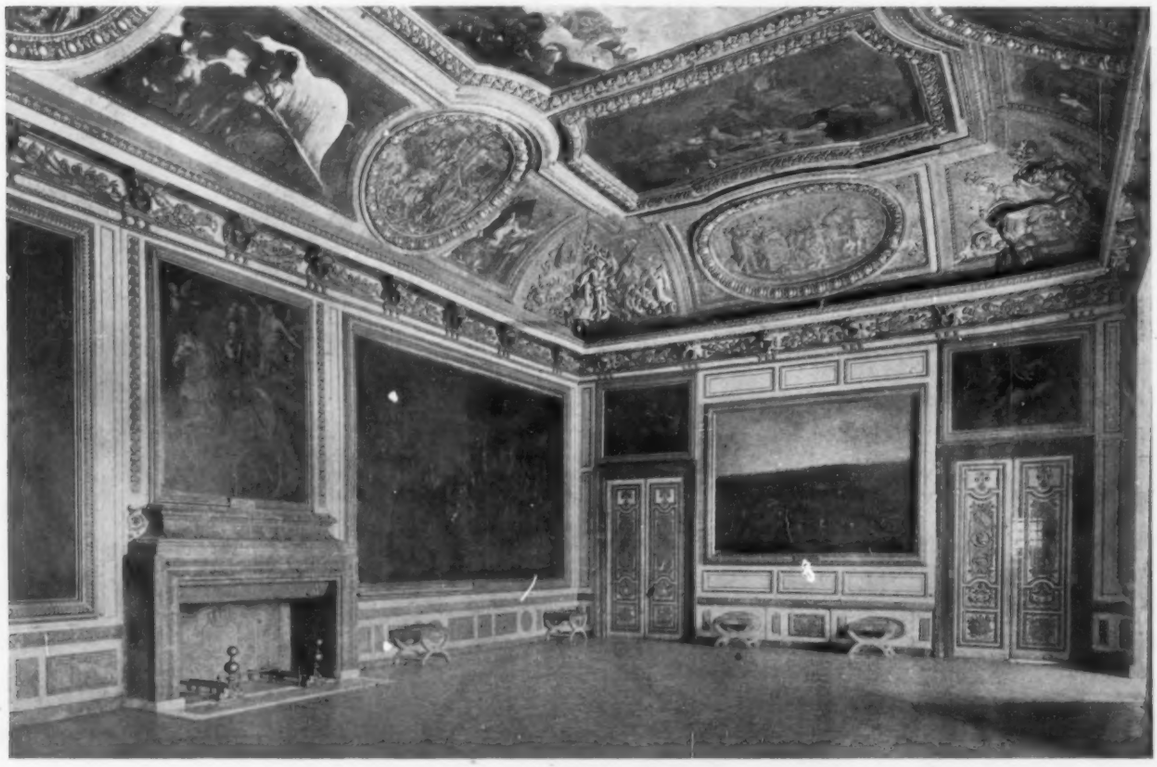
Boule Table from Palace of Versailles

It is true that much work of the period would be unsuited to use in the domestic architecture of to-day, but there may be larger things which we can learn from the *spirit* of "le Grand Siècle."

The "palatial" residence of some years ago, with ostentatious opulence unknown to-day, called for furniture and decorations in the style of Louis XIV, and "the Grand Manner" was the ideal of the large hotel even as recently as the erection of the Hotel Manhattan, in New York City, where, in the 43rd street lobby, the style may be seen in all its glory.

The whole idea of the great hotel has changed to-day in a reaction which swung from the obvious opulence of Louis XIV to the more subtle "smartness" of the Brothers Adam, and large residences turned mainly to Italian, English and Georgian prototypes for their inspiration.

The most valuable thing which is to be learned from the style of Louis XIV for application to-day is to be found, as was intimated above, in some of its larger aspects. It was a supremely self-confident style — a style which thought and functioned in large terms. The artists, architects and decorators of the period were the master minds who did the preliminary work, which later developed into the supremely perfect style of Louis XVI, and for this reason, if for no other, the architect and decorator of to-day will find "le Grand Siècle" a study valuable, inspiring and entertaining.



Salon de Mars, Palace of Versailles

DEPARTMENT OF ENGINEERING & CONSTRUCTION

CHARLES A. WHITTEMORE, *Associate Editor*

Heating the Small Garage

By R. E. BARTON

IT IS a strange fact, but none the less true, that approximately 90 per cent of the building construction entered into during the year 1919 was either directly or indirectly connected with automobiles. Garages, industrial plants for automobile manufacture, plants for manufacturing parts of automobiles, sales rooms, office buildings, service stations and small garages help to make up this list. The problems involved in the larger structures have been quite thoroughly investigated, but the problems in connection with the small garage have been neglected to a degree almost indicative of a lack of interest. The tremendous growth of the automobile industry and the almost universal use both for business and pleasure purposes make the care and housing of the machines an important consideration.

The greater number of residences being built to-day have a garage as an accessory equal in importance to the sleeping porch. There are, however, many such which have no heating arrangements, and inasmuch as the "year around" use of the car is so much more common than in past years, some method of keeping the garage above the freezing point is a necessity.

Whatever the type selected may be, it should, if possible, be placed outside the car space and should be in a separate enclosure with an entrance independent of the main garage room.

Each individual owner may have some definite idea as to how he wishes to have his garage heated, but the ultimate result in every case is the same; that is, to keep the temperature of the garage at such a point that the cooling system of the car will not freeze and the lubrication will not congeal due to a low temperature.

Consideration should also be given to the fact that at many times the owner likes to "fuss" around the car. In this case the garage should be kept at a slightly higher temperature than would be necessary simply for protection against freezing.

There are three principal elements which enter into the selection of the heating units: first, economy of operation; second, economy of installation; and third, fire protection. These are not here placed in positions of relative importance, but in the order of usual consideration.

Without doubt the most inexpensive apparatus to install is the gas steam radiator, but there is a possible danger in connection with this method of heating because the flame, although usually enclosed, is almost on a level with the floor, and as the gas vapors are heavier than the air, they might come in contact with the flame and thereby cause combustion.

There are, however, several devices of this type now in the market which receive the approval of the National Board of Fire Underwriters, and which may be installed without occasioning any defect charge on the insurance rate.

A hot water heating apparatus is probably the most satisfactory method of heating the small garage. A separate heater placed in the basement of the house and pipes run underground to the garage will give satisfactory results if the garage floor is not too near the boiler level. These underground pipes should be well insulated and should run in a conduit or waterproof trench. They should be installed in such a manner as to permit renewal or repairs without the necessity of tearing up floors and lawns. This can be done readily if a little foresight is used.

The radiator should be placed directly in front of the car, for being so placed it will require fewer sections to keep the machine from freezing. Draw-off valves should be placed at low points so that the system may be emptied when heat is not required and all high points must be well vented.

If the garage floor is not much higher than the level of the house heater, it is better to run the supply pipe up to the second floor of the house and drop down to the basement as shown in Fig. 1 to the garage. This is sometimes referred to as a loop or a false water leg. The expansion tank must be placed above the highest point of the system, if an open tank is used.

If the garage radiation is supplied from the house boiler, a separate line should be taken directly from the heater. If the garage is much lower than the first floor of the house and the loop to the second floor is not possible, one or two of the return risers from the second floor of the house, as shown in Fig. 2, should be used for the supply to the garage radiators. The return from the garage should be brought back separately to the heater. An installation of this type will maintain an even temperature, but obviously will not

be so flexible or so positive as a separate supply direct to the garage. Perfect circulation in the house system must be maintained in order that the return may have high enough temperature to be efficient. It is also well to consider whether the garage might not require heat at times when the house might be unheated.

Either of the systems mentioned can be used in cases where the garage and house are being built at the same time; but when the house is already built and the heating apparatus installed, the safest method is to install a separate heater, unless the house heater may be easily increased in size. Generally speaking, to increase the size of the heater would be more expensive than to install the separate heater, and it would not be any more economical in operation. If the garage is more than 60 feet from the house, a separate heating room should be connected to the garage. The heating room floor can be on a level with the garage floor and thus simplify the construction.

FIGURE 1

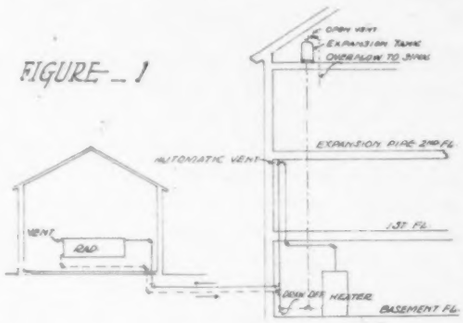
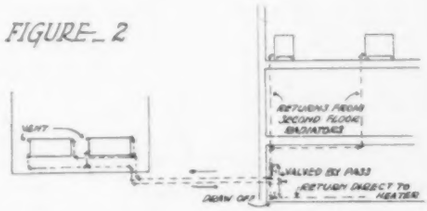


FIGURE 2



Steam heat as applied to the small garage is quite analogous to the hot water systems here described. Slight variations in equipment are necessary, but the average layman has a fairly comprehensive knowledge of these features. The one-pipe steam and the two-pipe gravity system are both applicable in many installations. There is, however, a point where hot water is superior to steam, and that is in maintaining a positive circulation with a low fire. Steam coils cool so rapidly with a "banked" fire that a sudden drop in temperature during the night may nullify the effectiveness of the installation. With steam a quicker heat may be maintained and with thermostatic control very satisfactory results may be obtained.

There is also the vapor system to consider. This method is efficient but more expensive to install than either the steam or hot water. It has advantages over either of the other systems which, in some cases, may outweigh the item of extra cost. Uniform heat more easily controlled than steam, quicker heating action than hot water, smaller variation range of temperature than either, are the advantages of a vapor system properly installed.

The study of garage heating develops many types of self-contained units which are adaptable to certain installations. In investigating these systems, fire protection, temperature control, fuel consumption, attendance—all must be taken into account. Electrical devices may be expensive to operate, and an interrupted current may cause considerable inconvenience and damage. It is also difficult to adapt electricity to general heating of the garage space, but for local heating such as the engine or water circulation it gives better results.

In heating public garages, a two-pipe gravity steam or vapor system is preferable. The most important item in laying out the heating apparatus for a large garage is to select the proper size boiler.

Most garage heating specifications call for a temperature of from 50 to 60 degrees. Radiation working in this temperature will condense from 50 to 75 per cent more steam than when working at 70 degrees. Therefore, boilers should not be selected from a catalogue's rating, but should be selected from their evaporating power. In figuring the amount of radiation required for garages the roof must be taken into consideration, as most garages have no air space between the ceiling and the roof, and the heat loss is nearly as great through the roof as through the walls. All skylights should be protected with coils or radiators to prevent down drafts. The placing of either pipe coils or wall radiation should be under the windows. The boiler room should be excavated so as to keep the radiation near the floor. If this cannot be done, the returns should be brought back to a receiver and pumped from there to the boiler. An electric driven pump can be used when the steam pressure is not great enough to run a steam driven pump.

The laws are quite strict in regulating the placing of a heating plant in public garages It is stipulated that the boiler room in all garages capable of containing five (in some cities, ten) or more cars must be entirely enclosed in fireproof construction and entirely separated from the garage proper. The entrance to such a boiler room must be from the outside of the building.

With the knowledge of heating as applied to large garages, and with the protective measure enacted to make such installation safe and secure, it is all the more astonishing to find that many single and two-car garages are not equipped with heating units giving a reasonable degree of safety.

Concrete Oil Tanks—II. Means of Oilproofing

By JOHN H. HESSION
Assoc. Mem. American Society of Civil Engineers

TO reduce the probability of cracks in the concrete the steel stress should be kept down to 10,000 pounds. On circular walls, where concrete acts wholly in tension, it is advisable to figure the concrete sufficiently strong to carry the load without the assistance of the reinforcement, in order to obviate cracking. It is recommended that the tension value of concrete be taken as 75 per cent of the ultimate in tension; hence for a 1 : 1½ : 3 mix, whose ultimate is 200 pounds per square inch, the wall tension would be figured at 150 pounds. The steel should be sufficient in itself to stand the bursting pressure at 10,000 pounds per square inch, without dependence upon the concrete.

CONNECTIONS. All connections to the tank should be made from the top. This is essential because in concrete tanks some difficulty is experienced in making absolutely tight connections. Should any break occur in connections at the bottom of the tank, there is danger of losing the entire contents, whereas with top connections the loss would be under better control.

VENTS. The ventilating of the fuel oil tank is an important feature. This is necessary in order to permit a supply of air to enter the tank when the oil is withdrawn, as well as to allow the gases to escape. The vents also serve the important purpose of preventing flames and sparks from getting into the oil and of avoiding spontaneous combustion. There is a variety of patented vents on the market, all of which have good points, but the architect must use care in the selection of this equipment. The vent should be examined from the standpoint of automatic control of the vapors. In other words, if vapors are passing out through the vent and, by some unfortunate circumstance, should become ignited either by lightning or sparks, the vent should be arranged so as to shut off automatically the flow of vapor. It is necessary to provide a device that is automatic, so that the vent may be kept open under ordinary conditions to permit a flow of air to enter and also to close instantly when the need arises. Without some such device the use of heavy oils may almost be a serious menace.

The vents should be extended to a point above the top of the structure in which the oil tank is located, and should have an additional fresh air inlet provided with an automatic check valve so that when suction occurs in the tank the check may open to admit air.

In Massachusetts the study of oil-tank installations, especially where used in connection with heating units of commercial or public buildings, has been conducted by the Fire Prevention Commissioner. In all such instances the location of the tank, the arrangement of fill pipe, the ventilating system and the general problem of safeguarding life and property have been carefully analyzed. It is rare, indeed, when two installations, identical in detail, may be encountered, and it is all the more important that the architect should be thoroughly familiar with the best practice in the construction of oil storage tanks.

OILPROOFING. If every care is taken in the design and construction, the resultant tank should be practically watertight. The construction is really of more importance than the design, as a poorly designed tank when carefully constructed will be very likely a much greater success than a correctly designed tank poorly built. Perfect work is essential in tank construction, but is difficult to secure owing to the class of labor that must be used and the ease with which a slight oversight may occur that will mar the results. An oil tank must be watertight and it can be made so if it is perfectly done; but such perfection is difficult of attainment in ordinary practice.

If the tank is watertight, it does not necessarily follow, however, that it will also be oiltight. Experiments have shown that small concrete vessels, which were able to hold water perfectly, have, when filled with oil, lost the entire contents in four days. This was a gasoline oil. The result with fuel oil would not be so serious. It would depend entirely upon the gravity of the oil. Even a heavy oil when highly heated becomes very thin and flows readily. It is for this reason that heavy oils must ordinarily be heated in order to be pumped. In this thin condition, oil has very much greater penetrating power than water. The need for oilproofing is, therefore, apparent.

The mixture of an integral compound in the concrete mass for oilproofing, while tending to better concrete, brings up problems which are not involved where a surface treatment is used. The integral method cannot compensate for poor workmanship or materials in the concrete, or for cracking due to settlement, contraction or other reasons. With the right surface treatment these imperfections can be remedied. Integrals cannot of themselves prevent oil attacks on the cement in concrete, but a cement-free surface coating will.

A surface treatment of oilproofing is essential if a tank is to be put to use within two months after

completion. Practically all oils will attack "green" concrete; while high gravity oils, such as kerosene and gasoline, have been known to attack old concrete. The oil in attacking concrete seems to have a softening effect which gradually disintegrates it. It may be well to state that many different views are held as to the action of oil on concrete. Some hold to the opinion that oil of the heavy type has no deleterious effect; others are equally firm in maintaining the position that oil destroys the cohesive action of the cement particles. If the cement has passed through the crystallization period, the probable destruction, due to the presence of oil, is very remote. Under other conditions, the chemical reaction between the cement and oil may lead to the "breaking down" of the mass. In order to harden the concrete more quickly, the tanks are sometimes filled with water and seasoned a month.

Silicate of soda is sometimes used to harden the surface of new concrete in order to permit using the tank somewhat earlier than the water cure allows. It should have a strength of 40 degrees Baume and should be brushed on in three to four coats of one part soda to four parts water, the final coat being one to two or one to one. This solution enters the surface pores, but does not penetrate very far into the mass. The purpose is to permit the concrete behind the surface to harden free from the presence of oil. Surface hardening is the main property of the soda application. It is not waterproof. If, therefore, the surfacing is perfect, good results should follow. If imperfect in any way, oil will go through the treatment into the concrete mass with probable resultant failure.

The silicate of soda treatment is good only for heavy oils. For lighter oils, magnesium fluo-silicate has been used, with a covering of spar varnish. The duration of this treatment has not yet been definitely determined, but it is known that the varnish cannot withstand water; and water is inevitably present mixed with the oil, also it appears as condensation on the inside surfaces of the tank.

A system of oilproofing which has given good results has been found in the use of cement surfacing. A coating of one part cement to three or four parts sand applied in two coats, the first a scratch and the last a finish, will, if well troweled, produce cement crystals which tend to make a watertight surface, and therefore a good barrier against the very heavy oils. Frequently, in addition to the mortar, there is incorporated some patented or other article whose purpose is to give extra waterproofing quality to the cement through colloidal or other action. One method extensively used is a coarsely ground iron similar to that used as a floor hardener. By thoroughly troweling the mortar, an exceedingly hard surface can be secured, owing to the presence of the iron. Unfortunately, the use of a plaster coat requires a large amount of cement, which accordingly presents the possibility of oil attack.

Another satisfactory method of oilproofing on the market is the "iron system." This consists of a finely pulverized iron, to which a chemical has been added that oxidizes the particles. The pulverized iron comes to the job in dry form, and after the addition of a suitable amount of water it is brushed on the concrete surfaces. The minute grains of iron are carried by the water into the surface pores, and as the water dries off, oxidation ensues, which causes the iron particles to expand and fill the pores. By filling the pores it is analogous to the colloidal action of some of the integral methods, and after the chemical action is complete, it may be likened to rust embedded in stone.

The brush applications number from four to six, though it may be necessary to carry on up to eight or ten, depending on the concrete and the conditions under which the work must be done. After the iron has been applied, the result is a thin but exceedingly dense and impervious surface of iron oxide, which appears to be free from all harmful reactions with oil.

To repair cracks with the iron system or any surface treatment, the openings must be carefully cut out to clean, hard concrete. These cuts are then filled with the same mixture of oilproofing as in the original treatment. When iron is used, the iron swells while the cement contracts, but sufficient iron must be added to produce a net expansion. Hence the filling tightens itself against the sides of the crack, definitely preventing leakage.

The oilproofing work should be done at the time the tank is constructed, because it is an exceedingly difficult and expensive matter to do oilproofing work after oil has once been introduced into the tank. The reason for this is that the surface pores become filled with oil and offer no chance for a bond for the oilproofing. It is necessary under such conditions to remove the oil filled surface by chiseling it off, or a new wall must be built to furnish a suitable surface. On a tank which is leaking badly, it may be useless to try to chisel the surface as the concrete very likely may be thoroughly saturated and additional chipping merely exposes another surface of oil filled pores. A new wall is the only recourse in such a case. Furthermore, the oil sludge in the bottom of the tank emits gases that are poisonous, and to remove them requires pumping for long periods. Often the workmen need to be provided with gas masks or diver's suits, which makes the work slow and expensive. Oilproofing is another instance where "an ounce of prevention is worth a pound of cure."

Concreting in Winter

By RAYMOND K. TURNER

CONCRETE work during winter is carried on in these days almost as extensively as in any other season of the year. Of course there are some precautions to be taken in winter work, although experience has shown that observation of simple rules for preparing concrete mixtures, followed by simple means of protecting the new work, will produce the best of results even under extremely cold weather conditions.

Most large contracting concerns consider their working season to extend throughout the whole year, regardless of season and temperature. It is true that there is some slight extra expense involved in conducting work under winter conditions, due to the extra precautions that must be taken. However, from the standpoint of all involved, it is quite worth while. The labor market and the material market are each benefited and relieved by the continuous working season; while from the standpoint of the builder he may benefit by an agreeable money market or a release of his structures completed at an earlier date.

Cold appreciably delays the hardening of concrete. This may be explained by the fact that temperature is known to control the rate of all chemical reactions, cold retarding chemical unions by affecting the quantity and quality of binder elements. Then, too, some solutions or parts of the chemical mixtures are active under high temperatures, but inactive under low temperatures. The fact is that cold weather concretes are slow setting and of low strength during the cold period.

If frozen before initial set has taken place, concrete, will upon an increase of temperature, thaw out and then attain a solid with seemingly no impairment of strength. This holds particularly true in mass work where a sufficient head is obtained to compact the mass that has been held apart by the formation of ice particles. If concrete passes through a series of these changes of alternate freezing and thawing, it is almost certain to be badly decomposed.

A careful selection of a good Portland cement is necessary in winter work. Not only should the cement pass the Standard Specifications, but it is advisable to have it quick hardening and developing high strength at early periods. The aggregates should be carefully selected, avoiding especially a very fine sand or a sand containing even a small quantity of vegetable loam, since a reduction of early strength is liable to result from the use of these materials.

Heating both the water and the sand and stone aggregates before mixing is the best precaution to take during periods of low temperature. By this heating of the constituents, the concrete mixture will be so warmed that rapid hardening will take place before freezing sets in. It is not sufficient to heat the mixing water alone unless the aggregates have been stored indoors in such a way as to give them considerable heat. When sand and stone are stored in the open, they are very likely to contain frost or pieces of snow and ice. Since the cement forms but a small bulk of the concrete, it need not be heated. However, it is well to store it indoors so as to protect it from severe cold. Mixing water is easily heated in any one of several ways which are most convenient for the particular job. Live steam or exhaust steam is sometimes run into the water tank, or coils or tanks may be so arranged over a fire as to produce a sufficient supply of heated water. Excessive heating of the water should be avoided as it may accelerate too much the setting of the cement, producing what is called "flash set." The sand and stone aggregates are best heated separately, so that segregation can be obtained until the mixture is ready to be proportioned.

On small jobs the aggregates can be piled over and around metal cylinders which may be fired with wood. Care must be taken not to allow the material resting against the cylinders to become too hot, as excessive heat has a deteriorating effect on some aggregates. When the aggregates are heated over cylinders, it is necessary to turn them over frequently so as to guard against this excessive heat and also distribute the heat throughout the pile. Steam jets are sometimes run into the piles of materials, or the material is piled directly on steam heated pipe coils. When the aggregates are stored in bins, heated pipe coils are often arranged so that the materials on leaving the bins pass between the coils. This method offers a means of imparting an even heat to the materials, provided they are used immediately after being taken from the bins. Steam is often applied directly to the piles of aggregates, but this is likely to be an inefficient method unless the materials are so covered with tarpaulins as to retain the heat. The coverings act as an efficient house for the piles of materials, preserving the heat imparted to them, and also preventing the materials from becoming watersoaked or even frozen solid if the temperature should drop extremely low. In judging temperature of these materials, it is best to use a thermometer rather than trust to an unsensitive, calloused hand.

Various substances such as common salt, calcium chloride and even glycerine and alcohol have been

added to concrete mixtures to prevent them from freezing. It is true that all of these substances lower the freezing point of the mixtures materially. However, this advantage is offset by other effects. Glycerine and alcohol both tend to lower the final strength of the concrete, while too much glycerine is objectionable because of its organic nature ; decomposition is very apt to set in, thus damaging the concrete. Common salt was used quite extensively in the mixtures when concreting in cold weather was first done. The mixtures procured in this way have a very low freezing point, but the quantity of salt used should be carefully regulated. Salt also tends to delay the set of the mixture as well as to produce a concrete of lower final strength. The use of salt in reinforced concrete is liable to be very objectionable, since salt mixtures will corrode the reinforcement, and there is also apt to be danger of electrolysis under some conditions. Salt also tends to produce a white surface scum commonly called efflorescence, which is unsightly on finished work. Use of calcium chloride has many of the same objections as are derived from the use of salt, although calcium chloride has the beneficial effect of hastening the hardening of concrete. Although there are some benefits in using these anti-freezing mixtures, the ill effects are so numerous that it is perhaps best to omit them.

The condition of the forms should be carefully investigated before placing concrete mixtures in cold weather. All particles of snow and ice and frozen concrete should be removed. Metal forms should be heated, while in extremely cold weather wooden forms should have a jet of steam turned against them or wet down with hot water so as to raise their temperature. It is well to turn steam on the reinforcement after it has been placed in very cold weather. This tempering of both forms and steel should take place immediately before the warm concrete mixtures are placed in the forms, so that there will be as little wasted heat as possible. The size of concrete batches mixed in cold weather should be so arranged that each mixer load can be quickly transported to the forms with as little loss of acquired heat as possible.

In building construction it is customary to enclose the structure in canvas when low temperatures are liable to be encountered. Within this canvas enclosure, heating units are so arranged as to keep the temperature somewhat elevated. Since warmth and moisture are necessary to effect the proper hardening of concrete, this is obtained by the use of stoves or salamanders. Pans of water are frequently placed on these stoves to produce a moist heat. Newly laid work is frequently covered with hay, straw or clean sawdust, and usually canvas is so placed as to provide an enclosure which may be warmed by steam or by allowing warm air to come up from the floor below through holes left for the purpose. Finished floor surfaces should be carefully protected, since many protective coverings are apt to be injurious. Manure, for example, should never be placed directly upon fresh concrete. The heat of manure is derived from the decomposition of its organic matter, and in this process nitric acid frequently forms, which will cause a surface injury to the concrete as well as an unsightly stain. Work should be protected as soon as completed, and under no circumstances should the protection be removed until it is assured that the concrete has hardened.

The removal of forms at too early a period should carefully be guarded against in winter work. In cold weather the concrete mixture sets very slowly, and even though frost does not enter the mixture, an extra period should be allowed for this delayed set, or hardening. Concrete which has frozen has often the appearance of thoroughly hardened concrete. When the mixture is struck with a hammer, it will produce a ring very similar to hardened concrete. The work should be carefully examined before the removal of forms, especially in the case of walls or slabs which are intended to carry loads. Small portions of forms may be removed and the exposed surface carefully examined. It is best to apply a heat test to the surface by directing upon it a jet of live steam or a flame from a blow torch.

The general rules which might be applied to concreting in winter, varying in their application, of course, with the exact conditions encountered, are therefore as follows :

1. Use care in selecting good materials.
2. Have the forms in such a condition as to receive the concrete without producing an appreciable lowering of temperature.
3. Preheat both the water and the aggregates.
4. Mix, place and protect the concrete so that initial hardening will take place before the work is exposed to freezing temperatures.
5. Guard against a too early removal of forms, making sure that the concrete has really set and not frozen.

These principles will also apply to stucco work, but in a good many cases when exterior stucco is applied in winter there is no great importance to the question of uniform strength, and a liberal application of salt in the mixture will permit the initial set to take place before freezing.

Another thing that it is well to bear in mind is that foundation work, strange as it may seem, does not freeze with any great degree between the forms so that if the top of the concrete is covered with salt hay, there is little danger of any damage.

ARCHITECTURAL & BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, *Associate Editor*

How the Annual Insurance Cost on Large Structures can be Reduced by Proper Design

I. BY THE EFFICIENT PROTECTION OF EXTERIOR OPENINGS

THE question of reduced insurance cost on buildings through the medium of design and specifications developed from the viewpoint of safer construction is one which is constantly being given more serious consideration by the architect. On the other hand, the architect cannot well be expected to be entirely conversant with fire insurance rating methods; in fact, the development of fire safe buildings has been actually placed upon a scientific basis and is now commonly known as Insurance Engineering. On many large buildings constructed within recent years, such as the Equitable Building in New York City, the method of achieving reduced insurance rates and increased safety against fire has been to place the architect's plans in the hands of a capable insurance engineer for the purpose of making various structural and equipment changes which would result in the desired reduction of insurance rate and increase in safety.

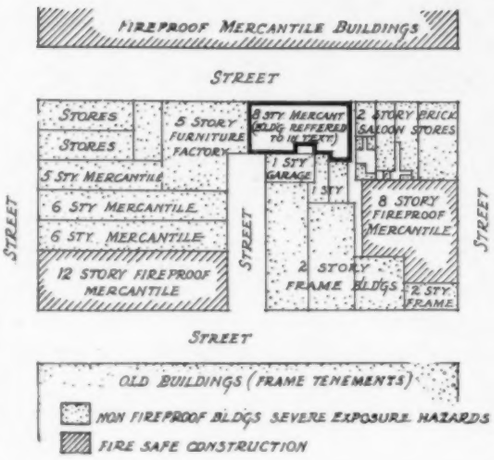
It is evident, however, that the more important features of Insurance Engineering are well within the grasp of the architect if he will give some study to the subject, and as many buildings are not submitted to insurance engineers, the average architect's service to his client in connection with the design of a large building can certainly be broadened by some consideration of the features of fire prevention and protection.

Therefore, from time to time consideration will be given in this department in a brief manner to the structural and equipment details by which insurance reduction may be achieved; but particularly to the actual business side of the problem, involving the amount of reduction which may be expected and explaining how insurance rates are made up, and what additional reduction in annual cost to the owner may be expected when better protective measures are incorporated in the design and specifications of such buildings. In this article the subject under consideration is that of safeguarding building exteriors against communicated fires through the medium of protecting hazardous exterior openings to withstand any possible entrance of fire from adjoining windows. The importance of this feature is clearly recognized by insurance companies in making up their rates, as will be shown in later paragraphs.

Briefly considering the danger of communicating fires, we find that approximately 60 per cent of our national annual fire loss is due not to fires originating within the building, but to communication from adjoining risks. Practically all great conflagrations have clearly demonstrated this point, and it is evident that no matter how carefully the interior of a building is designed and constructed it must necessarily partake of the potential fire hazard of surrounding buildings. Thus every section of a building exterior which is in any way exposed to an adjoining risk must be equally fire resisting. In other words, the roof and exterior openings must be so constructed and so protected against exposures that fire cannot enter any more readily than it would through the masonry walls of the building. At first consideration it would seem that the danger of communicated fires would not be as severe in buildings of masonry construction as that of interior fires; but general experience has not only proven the contrary condition to exist, but has shown clearly that both exterior and interior exposures must be guarded to obtain that degree of immunity from the great direct and still greater indirect loss incident to fires of any type.

Architects, builders and property owners have in the past and are to-day giving far too little thought to this matter of protection against exposures, and particularly the question of exterior openings. Nowhere in the world will be found such combinations of bad exposures and negligible protection as may be found in any of the cities, large or small, in this country to-day. It is almost impossible to select a site for the erection of any type of building, from a home to a great office or mercantile structure, without encountering immediately the problem of serious exposures. And is this problem generally recognized? Does the architect or the owner realize the continually existing danger of fires communicating from other buildings? Is it generally realized that of a building's entire fire risk, that from within the building, on the average, is estimated at 40 per cent, the other 60 per cent of the risk being from fires without?

It would seem not, if one judges by the hundreds of buildings which are being erected every year with scarcely a thought on this subject. Every day fires are occurring which prove the fallacy of building without proper protection against exterior exposures and also proving the utter uselessness of temporizing by the use of cheap and inferior forms of protection, by the use of plate and common glass, where common sense advises the use of wire glass, and of sub-standard, poorly designed types of exterior opening and roof protection.



It may also be convincing to note that the United States Geological Survey clearly recognizes this condition and the need for its remedy, as will be shown by the following interesting excerpt from "The San Francisco Earthquake and Fire," published by this department about ten years ago:

"While the fire danger from exterior fires to a given building is ordinarily estimated at 60 per cent, this risk practically becomes 100 per cent, of course, in a great conflagration. In San Francisco little protection from exterior fires had been adopted. There were few metal shutters or steel-roller shutters, and most of these were of imperfect design, proving unsatisfactory when tested. The openings in walls were fatal weaknesses in all the great buildings. Wire glass windows, though few in number, behaved well, but wooden instead of metal sashes were great sources of fiery contagion. Metal covering over wooden doors and window frames was generally inefficient. Ordinary glass was quickly cracked by heat from the exterior; the sashes took fire and the flames rushed in through the openings, consuming all combustible material within. Had they been furnished with metallic shutters of the best design, with wire glass in metal sashes, and with cornice and other exterior sprinklers, supplied by a private water plant, they certainly might have been saved."

While during the years since the San Francisco conflagration the trend of building construction has been slowly turning towards consistency and safety, the fact is evidenced more by improved building codes in the larger cities than by increased interest on the part of the building public. Those who design, build and own buildings must sooner or later come to realize the need for consistent firesafe construction; must realize that safety from fire lies in the original construction and equipment of every building, and *now* is the time to study such problems as that presented by exposures.

In speaking of the Baltimore conflagration, F. W. Griswold, then general inspector of the Home Insurance Company of New York, said in 1904:

"It is my most assured judgment that, notwithstanding narrow streets and inferior construction of buildings, the fire would not and could not have seriously spread had proper precaution been exercised in the protection of exposed wall openings, together with the use of non-combustible cornices and roof trim; and, in at least partial support of this assertion, it is a fact that where wire glass in metal frames (though not the best) was exposed to the heat of the conflagration, both front and rear, no damage by fire to the interior resulted; while in the case of imperfect metal-clad shutters, such as appear to have passed as approved, but little restraint to the spread of flame is evidenced, and this is also true of wire glass, where it was encased in metal-clad wooden frames and sash."

From the insurance viewpoint the term "exposure" may best be defined as a possible source of communicated fire. Exposures are both interior and exterior.

An interior exposure is a subdivision of space within the walls of a building which will not confine a fire which may originate therein, but will allow such fire to spread throughout the building.

An exterior exposure is that which presents the potential hazard of communicated fire.

For the purpose of this article, exterior exposures alone will be considered, and the general conditions and types of structures which constitute serious exposures will be considered in detail in later paragraphs.

Exposure protection necessarily resolves itself into an individual consideration. Ordinarily no two buildings are of necessity protected in exactly the same manner, as no two buildings bear the same relative location to the exposures involved. Obviously, then, the first step is a careful consideration of the location of the building in question and its present and probable future surroundings. What are the exposure hazards, or what are they likely to be? Is there danger of fire spreading from nearby buildings? Is there a possibility of new buildings being constructed near by which will present the menace of spreading flames?

It is plain that the exposure is not so great in a residential neighborhood or in a district where the surrounding buildings are of fireproof construction or contain little inflammable material as it would be if it were where the building site was surrounded

Comparative Exposure Table

Calculate the initial charge, as per tables, for given distance or condition for each side and enter in its column, add or subtract from charge as follows, carrying the net result by successive processes down the column to the bottom.

RISK	EXPOSURES 1. Openings protected by wire glass in metal frames and standard fire shutters and doors.				2. Protected by wire glass in metal frames or by standard shutters.				3. Wood sash and plain or plate glass.			
	FRONT	RIGHT REAR	LEFT		F	RT.	R.	LT	F	RT	R.	LT
Height 8	- - -	5										
Rate .25	- - -	1.60										
Distance	- - -	adj.										
Adjoining:	NO EXPOSURE											
Party Wall						SAME				SAME		
Independent Wall												
Windows Over		yes										
Communicating												
Length of Side:												
A-Risk	- - -	60'										
B-Exposure	- - -	60'										
Tables Used	- - -	7-14										
BLANK WALL OF RISK towards exposure deduct ⅓ of charge. (*No deduction if wooden cornice or mansard.*)		.020	.097	.076		.020	.097	.076		.020	.097	.076
" " OF EXPOSURE towards risk, deduct ⅙.		.136				.136				.136		
" " TO BOTH deduct 90 per cent.		.156				.156				.156		
OPENINGS NOT OPPOSITE each other deduct 30 per cent.												
" ON GRADE OR FIRST FLOOR ONLY, deduct 25 per cent.												
SHINGLE ROOF TO RISK increase charges 50 per cent. but not exceeding a sum which would make risk equal rate with exposure.												
✓LENGTH OF EXPOSED SIDE OF RISK.—Less than 75 running feet, 1 per cent. less for each foot. *No deduction if adjoining with communication.*	- - - -	.023	.017	.008		.023	.017	.008		.023	.017	.008
		.133	.080	.068		.133	.080	.068		.133	.080	.068
✓ " OF EXPOSURE.—Less than 75 feet, ½ per cent. less for each foot.		.009				.009				.009		
	- - - -	.124	.036	.031		.124	.036	.031		.124	.036	.031
✓HEIGHT OF EXPOSURE.—If less than 5 stories deduct 15 per cent. for each story less than 5. If over 5 stories and non-fireproof add 25 per cent. for each story over 5.	- - -	- - -	.044	.037			.044	.037			.044	.037
FALLING WALL HAZARD.—Add not less than 2 per cent. of the rate of the exposing risk.												
GLASS FRONT OR SIDE OF RISK.—Increase charge 10 per cent. if first story, 20 per cent. for second, and 10 per cent. for each additional story.												
" OF EXPOSURE.—Increase charge 30 per cent. for each glass story above first or grade floor.												
✓STANDARD FIRE SHUTTERS or approved Wire Glass Windows.												
✓ To window openings of risk.....40 per cent.	- - -	- - -	- - -	- - -	- - -	.050	.018	.015				
✓ If both.....60 " "	- - -	.074	.026	.022		.074	.026	.022				
To window openings of exposure.....33⅓ " "		.050	.018	.015								
If both.....50 " "												
To risk and exposure.....45 " "												
If both.....67½ " "												
NOTE.—Approved open sprinklers accepted as equal to standard fire shutters.												
LARGE AREA OF EXPOSURE exceeding 10,000 square feet and height exceeding intervening distance increase charge 20 per cent. and add a further 2 per cent. for each 1,000 in excess of 10,000.												
FRAME RISK increase charge 50 per cent. but not exceeding a sum which shall make rate of risk equal to 80 per cent. of exposure.												
✓IF BOTH RISK AND EXPOSURE RATES ARE BELOW 1 PER CENT.—Take such percentage of final result as the rate of risk bears to 1 per cent. *e. g.* if 65 cents, 65 per cent; if 45 cents, 45 per cent., etc.			.004	.004			.007	.006			.011	.009
Total Exposure Charge for all sides.		.050	.004	.004		.074	.007	.006		.124	.011	.009
HEIGHT OF RISK.—If under five stories high, deduct 15 per cent. of total charges for each story less than five. If over five stories high and non-fireproof add 15 per cent. for each story over five (not exceeding 75 per cent.)				.004				.007				.011
				.050				.074				.124
				.058				.087				.144
✓ Deduct for Working margin 20 per cent.	- - -	- - -	- - -	.012	- - -	- - -	- - -	.017	- - -	- - -	- - -	.029
THE EXPOSURE as computed under the table, shall be reduced as follows before being incorporated into the rate:—		BUILDING		.046				.070				.115
(a) By 18 per cent. in the case of the building for a risk rated on Non-fireproof Mercantile Schedule.				.012	- - -	- - -	- - -	.018	- - -	- - -	- - -	.029
(b) By 30 per cent. in the case of the building, and 75% per cent. in the case of the contents for risks rated on a non-fireproof schedule other than the Mercantile.		CONTENTS		.034				.052				.086
(c) By 65.6 per cent. in the case of fireproof buildings not rated on the Mercantile Schedule.												
(d) By 25 per cent. in the case of contents for all fireproof risks, subject to further deductions in conformity with the following table:—(as per F. P. E. M. Schedule).												

NOTE. The above tables show plainly the lowering of the exposure rate of insurance by proper use of standard forms of exterior opening protection.

Digest of calculations is as follows :

	BUILDING	CONTENTS
Wire glass, metal frames and standard shutters and doors	.046	.034
One of above with standard doors	.070	.052
Without protection	.115	086

by non-firesafe structures or are used to house businesses which necessitate the handling and storage of highly inflammable matter.

In the planning of large buildings to be located in or near residential districts, one important factor must not be overlooked. That is the question of the conflagration hazard. If the residential district in question is closely built up of frame houses having wood shingle roofs, a conflagration hazard undoubtedly exists. The records of almost all great conflagrations show flames traveling by the wood shingle and frame construction route straight into the heart of the mercantile or business section. Where it is planned to construct a large building in a section which is thickly built up with frame and wood shingled dwellings, the exterior of the building must be made absolutely fire resistive.

At first glance a large group of frame dwellings does not appear to offer any serious fire menace to a large building. It would seem impossible for sufficient heat to be generated to do serious damage; but fire records tell a different story. High winds and dry wood on the roofs and in the walls of dwellings menace thousands of mercantile buildings in this country to-day, and such exposure must be guarded against.

At Salem, Mass., the great conflagration started in the mercantile district, traveled out through the residential district along shingle roofs and frame houses, circled down towards the waterfront and set fire to the Naumkeag Mills, causing a $3,000,000 loss there. This was in the second conflagration, immediately following the first, which had practically died down when a shingle roof on a school, across the valley in South Salem, caught fire from flying brands and created another conflagration, which resulted in the destruction mentioned.

The Severity of Exposures

There are many factors which must be taken into account in the consideration of the severity of an exposure, and it is naturally difficult to give any definite requirements determining the degree of exposure. In general, however, serious exposures are as follows:

(*a*) A building of combustible type, 25,000 cubic feet or more in size, and located within 40 feet of the structure in question.

(*b*) A smaller building within the same distance and containing highly inflammable material: such as a moving-picture theatre or building in which nitro-cellulose films are stored; garage or any building, such as used for the storage of oils, paints, varnishes or any material which would serve to create a quick, hot fire.

(*c*) If the adjacent buildings are of combustible type and have large areas such as a theatre or contain a large amount of inflammable material such as a furniture or piano factory, they constitute dangerous exposure to a distance of 70 feet.

(*d*) If there are a number of combustible buildings within an area of 250 feet from the building, so that a fire might become general in this area, the conflagration hazard exists and a serious exposure hazard is constituted.

(*e*) If the proposed building is located in a conflagration district, it should be considered as seriously exposed.

The amount of protection which will be provided, will, therefore, depend on surrounding buildings, their construction, contents and distance from the building in question.

In general, the following rules should be followed, modified somewhat, of course, by existing conditions:

The exterior walls of fireproof or sprinkled mill constructed buildings should be of at least 12 inches of masonry. In case party walls are used these walls should be not less than 16 inches in thickness. All walls should have a parapet not less than 3 feet high. All doors in party walls should be of a type of fire-door approved by the Underwriters' Laboratories, one on each side of the wall. All outside doors should be of metal.

Wire glass windows in metal frames and sash offer excellent protection against moderate exposures and prevent the passage of flame from floor to floor through the windows. All windows above the third floor should be of this type, and in the matter of three-story buildings and the lower three floors of higher buildings great care must be taken before the use of wire glass is decided against. The exposures must be studied carefully, keeping in mind the size of the building, the advantages of wire glass from the breakage as well as the fireproofing standpoint, the expense of changing to wire glass at a later date should exposure conditions be made more severe, the fire-fighting facilities of the community, and the insurance saving where wire glass is used.

In the selection of metal frames for wire glass windows, the weatherproof qualities must not be lost sight of. Some types of metal sash and frames corrode quickly and should be avoided, the architect insisting on assurance as to this point from the manufacturer.

Where windows are seriously exposed they should be protected by properly constructed shutters in addition to wire glass.

Having considered, in a general way, the conditions which create exposures of a more or less serious nature, the natural question is how to

guard against these exposures in the most practical and efficient manner, considering always the factor of cost — and right here a digression will be made to emphasize this matter of cost.

The Cost Factor

From the standpoint of those who purchase structural materials, cost can no longer be defined as the amount of money paid for a material or device. We build our buildings for permanency; our office buildings, hotels, warehouse and mercantile structures are erected with the idea that they will stand for many years and give good service: therefore, the *real* cost is the ultimate cost and can better be defined as the total expense of the installation and maintenance of materials and devices, plus or minus the insurance credit or penalty granted or imposed for the use of the product in question. In other words, in the consideration of the protection against exposures, various questions of cost vs. ultimate cost must be decided. For instance, window frames and sash of solid or hollow steel have a far higher degree of permanency and necessitate a much lower cost of maintenance than those of metal covered wood, at the same time offering far greater safety. It is false economy to let the lower first cost of metal covered wood windows influence the builder to install this type, or wooden windows or metal windows of inferior design and workmanship; it is false economy to use plain glass where wire glass should be used, even though the risk seems slight, or tin clad doors when all metal doors may be obtained at a slight increase in price. Buy with the sure knowledge that safety and permanency are the cheapest in the end.

A Practical Example

With this view of the cost proposition in mind, let us consider a practical example of protection. The accompanying block plan will serve as a basis on which to work. This shows an ordinary city block in a mercantile section. We are considering the construction of an eight-story mercantile building in the location designated by the heavy line.

A study of the map shows that this building is exposed on both sides and the rear to a severe conflagration hazard, which in itself necessitates the utmost care in design. The five-story furniture factory immediately adjoining constitutes a severe exposure, containing as it does a hazardous occupancy where much inflammable material in the form of wood, paints and oils is used and stored, and being of joisted brick construction. A fire in this building would most seriously threaten the structure under consideration, and for this reason the best known protection for window openings should be employed. This consists of wire glass in metal frames and each opening further protected by the use of automatic steel shutters from the terrific heat which would be generated by a fire in this building. If there are door openings on this side, they should be protected by automatic metal fire doors. All protection should be of types approved by the Underwriters' Laboratories. In this manner the side of the building in question, which we will call the west side, has every opening in the masonry wall protected in such a manner that in case of fire in the furniture factory the heat would cause the automatic doors and shutters to close when the fusible links with which each is equipped has been melted. Here we would have a standard fire door barring the progress of the flames, heat and smoke through the door openings, and metal shutters backed by wire glass and metal windows, protecting the window openings — a solid, impenetrable wall against which the flames will seek entrance into our building in vain.

On the opposite, or east side, of the building we have different conditions entirely, the building adjoining being only two stories in height. The exposure here is severe at the lower stories. All windows should be of wire glass in metal frames, and all windows over the roof of adjoining buildings to a height of 30 feet should be equipped with steel shutters.

On the rear, or south side, of the building all windows west of the court, being over the garage and also exposed to possible fire in the furniture factory, should be of glass in metal frames and equipped with automatic shutters. Windows in the shaft should be of wire glass in metal frames, while those east of the court would be of wire glass, shutters being necessary only opposite and one story above the one-story building adjoining.

The use of shutters as a further protection where the exposure is unusually severe is a precaution in case of the possible generation of heat that would cause the melting of wire glass. On these windows, shutters alone would not be sufficient protection because of radiant heat.

The walls in this building will, of course, be of at least 12 inches of masonry, and if steel framework is used, care will be taken to protect the ends of beams and girders so that they will not be affected by the heat of a nearby fire.

Reducing Insurance Costs

Definite proof of the value of proper protection against exposures will be found in the comparative exposure table shown herewith. A clear exposition of the actual working out of insurance rates will be of direct interest to those who plan commercial structures.

This table shows the method of working out the exposure charges on building and contents of the building heretofore discussed.

The final insurance rate on a building and its contents is made up of the rate on building and contents, plus the exposure charge. As we are only interested in the exposure charge for the purposes of this article, we will take for granted that the building rate (without exposure charge) is .25. Thus in the table the rate is shown as .25.

With this data and the information that the west wall of the risk is higher than the exposure and also pierced with windows, we find in referring to Table 7 of Exposure Rates, issued by the Insurance Board of New York and on which this article is based, that the initial exposure charge to be made against the building under consideration is .020. When the insurance rate of the building that constitutes the exposure is greater by .50 or more than the rate on the risk, an additional exposure charge is made which is found in Table 14. In this instance the rate on the former is 1.60 and on the latter .25, making a difference of 1.35, which as per the table calls for an additional charge of .136, as indicated at the head of the first column on page 43.

In the table on page 43 it will be plainly seen that the exposure rates have been figured three times, each time under different conditions of protection against exposure. The deductions from and additions to the initial charge will be easily understood if the left-hand column is carefully read. The buildings constituting the exposure of the rear and left side have a rate of insurance less than the five-story building at the right, and the difference between these rates and that of the building under consideration (.25) is less than .50, so no addition is made to the initial charge for these exposures.

Assuming the value of this building to be $250,000, and the value of contents $500,000, and using the rates obtained in the exposure table, we find:

Exposure charge on this building with exterior openings unprotected:

Building, $250,000, at .115	$287.50
Contents, $500,000, at .086	430.00
Total exposure charge	$717.50

By the use of wire glass in proper metal frames this is reduced to:

Building, $250,000, at .070	$175.00
Contents, $500,000, at .052	260.00
Total exposure charge	$435.00

By the use of steel shutters, in addition to wire glass, as extra protection against unusually severe exposures:

Building, $250,000, at .046	$115.00
Contents, $500,000, at .034	170.00
Total exposure charge	$285.00

It must be remembered that to the exposure charge saving shown here must be added the saving on the rate on building and contents, which is naturally reduced by proper exterior wall construction and the lowered cost of maintenance. This total saving alone is sufficient reason for properly protecting the building against exposures, and when increased safety and the factor of immunity against the disturbance of business and destruction of lives and valuable records are considered, the fact that many buildings are to-day being constructed without such protection is almost incomprehensible.

There is no doubt that proper safeguarding of a building along these lines adds somewhat to the original investment; but from a purely financial viewpoint it is evident that in the hypothetical building described in this article there would be a saving on the general insurance cost of approximately $1,000 a year, including both exterior and interior exposure reduction. This is a very conservative estimate, as the value of the contents carried in this building would probably be much greater than that given; consequently the insurance saving would be considerably increased. However, on a basis of 5 per cent on the additional investment, this would allow an extra $20,000, which could be well spent on the building, and which any owner being fully appraised of the value of such expenditure would not hesitate to authorize.

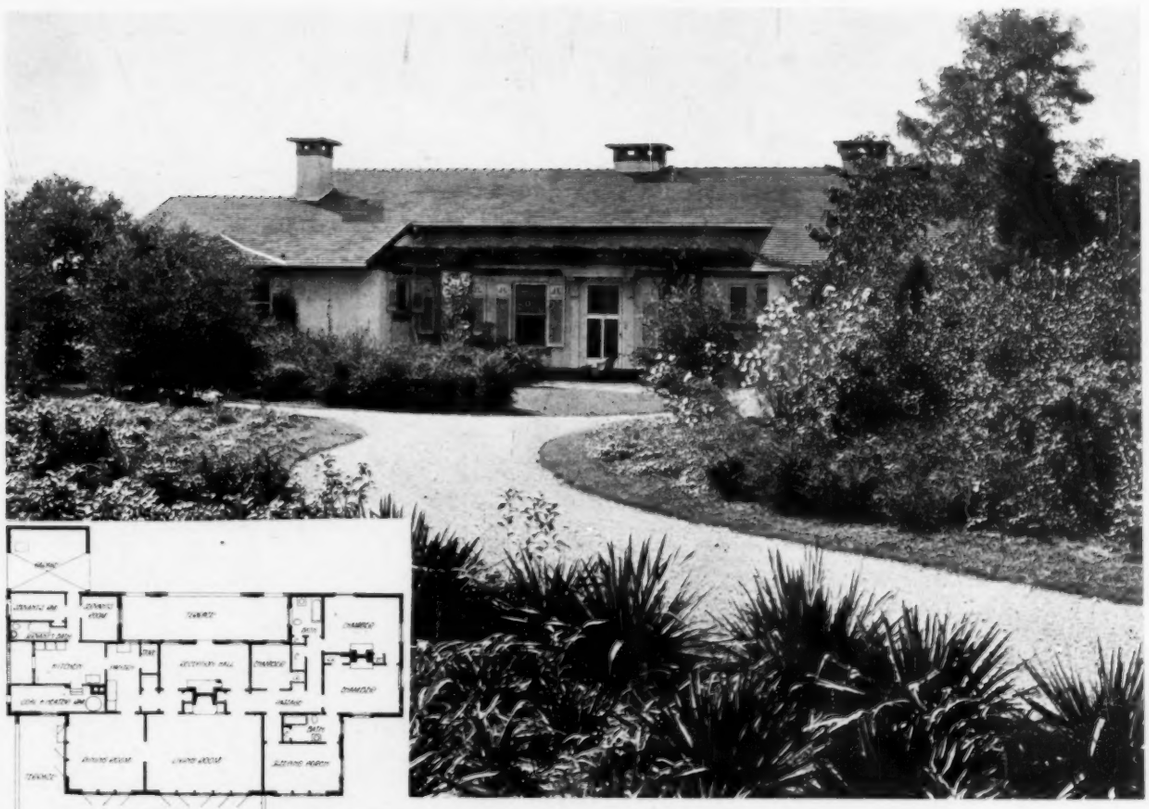
It may be interesting to architects to know that insurance engineering service is available to them and for their clients without direct cost. There are several large insurance agencies which maintain an Insurance Engineering branch to be placed at the disposal of their clients. Arrangements for this service in checking over plans and making recommendations in estimating the saving can be made through the medium of an agreement to place insurance through such agency. This is a service which architects would do well to take advantage of more generally. Insurance rating methods are being gradually standardized through the adoption of broadly applicable schedules and attention to matters of fire protection is rewarded by appreciable reductions in rates.

A Southern Bungalow, Norfolk, Va.

THE RESIDENCE OF CLARENCE A. NEFF, ESQ.

NEFF & THOMPSON, ARCHITECTS

THE GARDEN FRONT



FLOOR PLAN AND ENTRANCE FRONT

EDITORIAL COMMENT

TAX EXEMPTION FOR MORTGAGES

WITH the very large industrial expansion that is steadily taking place in many sections of the country, the problem of housing is reaching an acute stage and threatens more widespread and serious effects then during the critical period of the war. Efforts that are being made to meet the demand are sporadic and almost negligible when compared with the great need. The Atlantic coast section of the country is especially active in an industrial way, as is evidenced by data from the building department of New York City. In Long Island City, Borough of Queens, which in recent years has become a strong manufacturing center, factories are being erected at the rate of one every week, and in the neighboring Ridgewood and Jamaica sections at the rate of one a month. In comparison with this startling growth, the total inadequacy of housing facilities is seen in the fact that less than a dozen tenements were erected in the same borough during the past year.

This rate of industrial expansion will have to be curtailed unless something is soon done to provide the necessary houses for the workers. It is reported that one large manufacturing concern in this district has plans under way for the erection of 250 dwellings, and the aggravated conditions now existing are reflected in the requirement that at least two members of each family occupying a house shall work in the establishment of the owner.

It is generally agreed that the most effective method of meeting the situation is through private enterprise and not through governmental participation, although such aid as can be given the movement by the Government without creating gigantic departments that often function with waste and extravagance should be made available. Private enterprise does not ordinarily interest itself in philanthropy or in movements for the benefit of humanity alone; it works for profit and reserves the right to devote its energies to those fields promising the greatest returns. The solution of the housing problem is no exception; it can be effectively solved through the use of private capital, but there must be a rate of return assured that will equal that obtained from other conservative investments.

At the present time the greatest obstacles to more building of residential character are the scarcity of money and the high interest rate holding on what money is available. Sources for large sums of money for building purposes are limited, and attempts made to meet the demand by distributing mortgages in small amounts entail an overhead cost that makes a rate approaching 7 per cent for the duration of the mortgage necessary to insure an adequate return.

The only definite and immediate prospect for substantial relief is in the passage of the bill known as H. R. 8080 now before Congress, which provides for the exemption of the income tax on mortgages not exceeding $40,000 in principal held by an individual. This goes to the root of the matter and if enacted into law will have a very beneficial effect on this distressing situation. Building materials and labor are without any question high and the supply is limited, but these conditions alone are not responsible for the lack of building. Apartment houses and other residential buildings that have been erected even at present high prices are proving profitable investments. In the Bronx section of New York rents as high as $22 per room are readily obtained and eagerly paid. The great difficulty, however, is the almost total lack of mortgage money to finance construction. This shortage is caused by the fact that income from mortgages is taxed in the same proportion as income from business stocks, making the net return to the investor a much lower figure than he can obtain from the investment of the same funds in municipal and state bonds that are exempt from all taxation. It is not difficult to understand why investors refuse to loan money on mortgage that gives a return limited in most sections by law to 6 per cent, when that income is materially reduced by taxation. On the other hand, the security that is back of well selected mortgages would make this type of investment specially attractive if for a limited time it were given the same preference in the taxation as enjoyed by state and municipal bonds.

No other remedy will be as effective in giving immediate aid. With a fair return assured from mortgages, building money will be plentiful. The demand for living accommodations is so great that building will be immediately stimulated, with the result that the supply will approach the demand and a tendency started toward reduction of rents.

The present condition is so acute and holds such peril to the welfare of the nation's workers, that this aid should be promptly extended by the Government. A theory of taxation is that no income should be free from contributing to the support of the Government, but the present exigency requires an adjustment of theory to meet practical requirements. The nation needs homes for its workers; there is now no prospect of their being supplied; the exemption from taxes on a limited amount of mortgage investments and for a limited period will greatly relieve the situation, and public opinion should be aroused to demand it.

20-year Barrett Specification Roof on Buildings of Union Stock Yards, Limited, Toronto, Canada. Architects, Union Stock Yards, Limited. General Contractors: Archibald & Holmes, Toronto, Canada. Roofers: The Maitland Roofing & Supply Company, McDermid Bros., Successors, Toronto, Canada.

100,000 Square Feet of Barrett Specification Roofs

The above photograph shows the mammoth new buildings of the Union Stock Yards, Ltd., Toronto, in process of construction.

This is a roofing job of more than one hundred thousand square feet, covering one continuous building, extending back beyond the sixth monitor in the picture.

Naturally, in deciding what type of roof to adopt for this enormous plant, the question of cost had to be given careful consideration.

It is significant, therefore, that a Barrett Specification Roof should have been decided on.

It means that the Union Stock Yards architects fully realize what so many architects and builders have come to appreciate—that it *pays* to buy the *best* roof because, while the original cost may be a little higher, *the cost per year of service is lower than for any other type.*

Barrett Specification Roofs are used on more of the permanent structures of America than any other type of roof. They take the base rate of fire insurance and are

Guaranteed for 20 Years

So sure are we of the service Barrett Specification Roofs will give *under the most severe conditions,* that we are prepared to *guarantee them for 20 years,* in all towns of 25,000 or over, and in smaller places where our Inspection Service is available, provided they are 50 squares or more in area. The guaranty costs you nothing. We merely require that our Specification dated May 1, 1916, shall be strictly followed and that the roofing contractor be approved by us. The guaranty is a Surety Bond issued by a well-known fidelity and guaranty company.

Copy of The Barrett 20-Year Specification, with roofing diagrams, sent free on request

The Barrett Company

New York, Chicago, Philadelphia, Boston, St. Louis, Cleveland, Cincinnati, Pittsburgh, Detroit, Birmingham, Dallas, New Orleans, Kansas City, Minneapolis, Salt Lake City, Nashville, Seattle, Peoria, Atlanta, Duluth, Milwaukee, Bangor, Washington, Johnstown, Lebanon, Youngstown, Toledo, Columbus, Richmond, Latrobe, Bethlehem, Elizabeth, Buffalo, Baltimore

THE BARRETT COMPANY, Limited: Montreal, Toronto, Winnipeg, Vancouver, St. John, N.B., Halifax, N.S., Sydney, N.S.

Manufacturers' Catalogs and Business Announcements

CATALOG REVIEWS

The publications listed below have been recently prepared by building material and equipment manufacturers. Unless otherwise stated, copies can be obtained without charge by addressing the concerns direct at the addresses given.

ARCHITECTURAL AND BUILDING CODE SERVICE. NATIONAL LUMBER MANUFACTURERS' ASSOCIATION, Chicago, Ill.

" Building Ordinance " (5½ x 8 ins.). 62 pp. Cloth cover.

Since it became known that more than a thousand cities of 30,000 persons or less in the United States were without a code for the control of building activities, this little book was prepared to fill the need. This condensed form of ordinance is modeled upon those in use in our larger cities and opens with fire limits which are to be determined by local practitioners. This is followed by a section on permits, duties of inspectors, penalties for violations and definitions. Following this is found the regulation requirements, classes of construction, etc. A generous amount of space is given to equipment, fire prevention and an appendix of explanatory matter. The adaptability of this code to growing communities has been kept in mind by its compilers, and it should serve admirably as the nucleus of a more specific work.

THE CROWELL-LUNDORFF-LITTLE COMPANY, Cleveland, Ohio.

" Blue Book of Industrial Construction " (8½ x 11 ins.). 38 pp.

This pamphlet recently issued by the above organization is a graphic record of past performances and an index of the variety and quality of structures in which they are prepared to undertake erection. A corps of construction experts, familiar with the erection of industrial and mercantile buildings from the designs of architects and engineers, have standardized no less than twelve types covering the field from the clearstory and monitor foundry building to the sawtooth roof weave shed. These are shown by as many miniature blue prints and sketches by way of suggesting to prospective builders the nature of their requirements. A strong point is made to architects of this firm's ability to co-operate in the furnishing of industrial data and their facility to handle large construction projects.

ARMSTRONG CORK COMPANY, Lancaster, Pa.

Armstrong's Linoleum " Pattern Book — 1920" (3½ x 6 ins.). 176 pp.

The above handbook, containing the complete up-to-date line of patterns made by this company, is printed in color giving samples of the design contained in similar areas. Where architects are called upon to guide clients in the selection of floor coverings, this book, which is prepared for the benefit of linoleum sales departments, will be a help in showing color scheme, scale and appropriate patterns. Tile, parquetry, textile and other effects may here be closely compared in condensed form. There are 289 patterns, 90 of which are new this year.

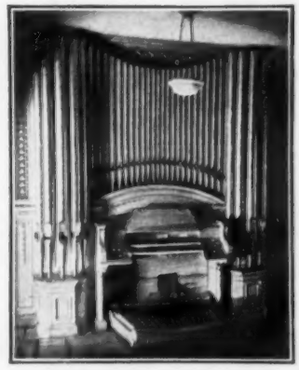
ANNOUNCEMENTS

Gordon Laidlaw Smith, architect, of Cincinnati, Ohio, recently returned from overseas service as a Lieutenant of Engineers, announces the opening of an office for the practice of architecture at 341 Volunteer State Life Building, Chattanooga, Tenn. Manufacturers' samples and catalogs requested.

Alfred C. Bossom, bank architect and engineer, announces the removal of his offices from 366 Fifth avenue to 680 Fifth avenue, New York, where he has made special provisions for his banking clients when they visit New York.

Frederick Meisler announces the opening of an office for the practice of architecture on Washington avenue, Little Ferry, N. J. Manufacturers' samples and catalogs requested.

Messrs. Keffer & Jones, Des Moines, Ia., announce the removal of their office to 204 Masonic Temple.



For Sale — Residence Pipe Organ

Having sold my house, this beautiful Hutchings-Votey pipe organ must be removed before April 1, and I offer it for sale at a fraction of its cost. It was built to order for me by Mr. Hutchings of Boston, is a splendid instrument in every way, and is in perfect condition. It occupies a floor space of about 6 by 12 feet and is about 11 feet high. The blower plant is in the basement and occupies about the same floor space by about 6 feet high. It is blown by motor and the action is electric. It starts by switches in the organ front. The case is white mahogany, hand carved. The pipes are antique gold. A self-player can be installed if desired. The instrument may be seen and played at any time at my residence, 307 West 91st Street, New York City.

DR. THOS. L. BENNETT.